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~~Research Design for the Violet Site Alternative,
New Lock and Connecting Channels,
St. Bernard Parish, Louisiana~~

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August 1990

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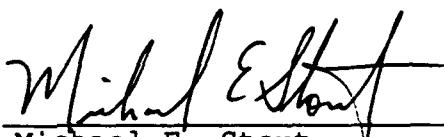
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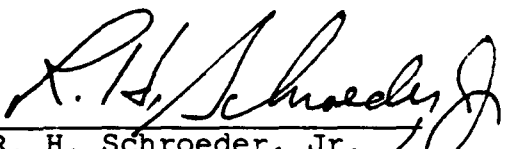
The investigation reported in this volume was designed, funded and guided by the U.S. Army Corps of Engineers, New Orleans District as part of our cultural resources management program. The effort documented in this report was the development of a Research Design for the Violet Site Alternative, New Lock and Connecting Channels, St. Bernard Parish, Louisiana.

The research design, when implemented, will result in an adequate assessment of cultural resources in the project impact area. We concur with the Contractor's findings and recommendations.


Edwin A. Lyon
Technical Representative


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Authorized Representative
of the Contracting Officer

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R. H. Schroeder, Jr.
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**RESEARCH PLAN FOR THE INVESTIGATION OF
CULTURAL RESOURCES IN THE AREA OF THE
PROPOSED VIOLET SITE ALTERNATIVE,
NEW LOCK AND CONNECTING CHANNELS,
ST. BERNARD PARISH, LOUISIANA**

by

**M. K. Shuman
L. D. Nakashima
J. Mossa
H. A. Franks
K. Jones
F. Smith**

1989

**Performed under Contract with the
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**Museum of Geoscience
Louisiana State University
Baton Rouge, LA 70803**

TABLE OF CONTENTS

List of Figures	2
Abstract	4
Acknowledgments	5
Chapter One: Introduction	6
Chapter Two: General Description of the Project Area	7
Chapter Three: Geomorphology of the Project Area	12
Chapter Four: Prehistory of the Project Area	32
Chapter Five: History of the Project Area	45
Chapter Six: Previous Investigations	56
Chapter Seven: Research Design	63
Chapter Eight: Field Methodology	77
References Cited	83

LIST OF FIGURES

Fig. 1: Location of the Project Area	8
Fig. 2: Holocene Delta Complexes of the Mississippi River Delta Plain	14
Fig. 3: Generalized Geology of New Orleans and the Project Area	16
Fig. 4: Land Loss in the Project Area	18
Fig. 5: Paleogeography of the Project Area, about 3500 to 4000 years Before Present	19
Fig. 6: Paleogeography of the Project Area, about 2600 to 2800 years Before Present	20
Fig. 7: Paleogeography of the Project Area, about 2000 to 2400 years Before Present	21
Fig. 8: Paleogeography of the Project Area, about 1400 to 1800 years Before Present	22
Fig. 9: Paleogeography of the Project Area, about 600 to 1400 years Before Present	23
Fig. 10: Paleogeography of the Project Area, about 300 to 600 years Before Present	24
Fig. 11: Location and Names of the St. Bernard Delta Distributaries and Local Geographic Features	25

Fig. 12: Comparison of Bank Lines Between the 1879-94 and the 1973-75	
Hydrographic Surveys. (Miles 89.5 - 84.1)	26
Fig. 13: Comparison of Bank Lines Between the 1879-94 and the 1973-75	
Hydrographic Surveys. (Miles 84.1 - 79.2)	27
Fig. 14: Soil Associations in the Vicinity of the Project Area	29
Fig. 15: Township 13S Range 13E Map from 1831	47
Fig. 16: List of Research Questions	64
Fig. 17: Correlation of Aboriginal Sites with Relict Distributary Channel of	
Mississippi River	67
Fig. 18: Site Probability Within a Distributary System	69
Fig. 19: Location of Logging Railroad as Determined by Scars on Landscape	
Detected in Aerial Photographs	74

ABSTRACT

This report describes the prehistory, history and geomorphology of a wetlands area between the Mississippi River and Lake Borgne in St. Bernard Parish, Louisiana. Known cultural resources of this area are enumerated and evaluated and a plan is presented for the discovery and investigation of heretofore unknown cultural resources in the project area.

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The authors wish to thank the Cultural Resources staff of the Environmental Analysis Branch of the New Orleans Engineer District for their assistance in providing maps and other documents. We would also like to thank the personnel of the Division of Archaeology, Office of Cultural Development, Department of Culture, Recreation and Tourism, for their assistance. We are further grateful to Mrs. Joyce Nelson, of L.S.U.'s Cartographic Information Center, for her kind help with maps; to Ms. Karen Corkern, for her administrative skills; to Mrs. Sharon Newman for her editorial help; to Mr. Vilva Natarajan, for his knowledge of word processing; to Mr. Rick Bessant, for his statistical experience; and to Summer Shuman.

CHAPTER ONE:

INTRODUCTION

by

M. K. Shuman

In 1988 and 1989, New Orleans District, Corps of Engineers, studied several areas along the Mississippi River as locations for a replacement of the Inner Harbor Navigation Canal Lock. One of these possible locations was in St. Bernard Parish, near the town of Violet. Because these studies were preliminary in nature, a large area of potential impact was involved. The actual area, however, will be greatly reduced during project planning.

Accordingly, this report describes the area in question in terms of its geographic, biological, and geomorphological characteristics and describes the cultural resources that have been reported to date within the study area. Also discussed are significant sites in the environs of the project locality. The prehistory and history of the general area are presented as context for a research plan to determine what additional cultural resources exist in the project area. This research plan includes an elaboration of high probability areas, based on a reconstruction of past natural environments, and a methodology for investigating a representative sample of those areas.

CHAPTER TWO:

GENERAL DESCRIPTION OF PROJECT AREA

by

Malcolm K. Shuman and Herschel A. Franks

General

The project area is an expanse of backswamp and marsh located between the east bank of the Mississippi River, near the town of Violet, in St. Bernard Parish, and the southwest shore of Lake Borgne, and north of Highway 39 (The Old St. Bernard Highway) (Figure 1). It consists of approximately 6,150 acres, some 91 percent of which is marsh. The only substantial dry land in the project area is a corridor that lies just south of the town of Violet, and crosses both natural and artificial levees of the Mississippi River. Elevations vary between 0-5 ft above MSL (Mean Sea Level).

Several bayous wind their way through the wetlands portion of the study locale, notably Bashman Bayou and Bayou Dupre. At least one of these, Bayou Dupre, has been enlarged to make a drainage canal. In the northern part of the project area, considerable dredged material has been deposited by previous construction and maintenance of the Mississippi River - Gulf Outlet Project. In addition, at least two pipelines cross the study area; a review of files in the State Division of Archaeology indicates that no cultural resources survey was conducted in connection with their construction.

Soils in the study area pertain to the Commerce-Sharkey association, which are the level, alkaline soils of the Mississippi River's natural levees and its distributaries; freshwater swamp with an organic surface layer one to several feet thick; and saltwater marsh, most of whose land is peat or muck underlain by slightly firm to semi-fluid gray clays (USDA 1971).

Climate:

The location of the study area is sub-tropical. Rainfall exceeds 160 cm (64 in) annually, with the maximum rainfall occurring in August and September. Mean annual

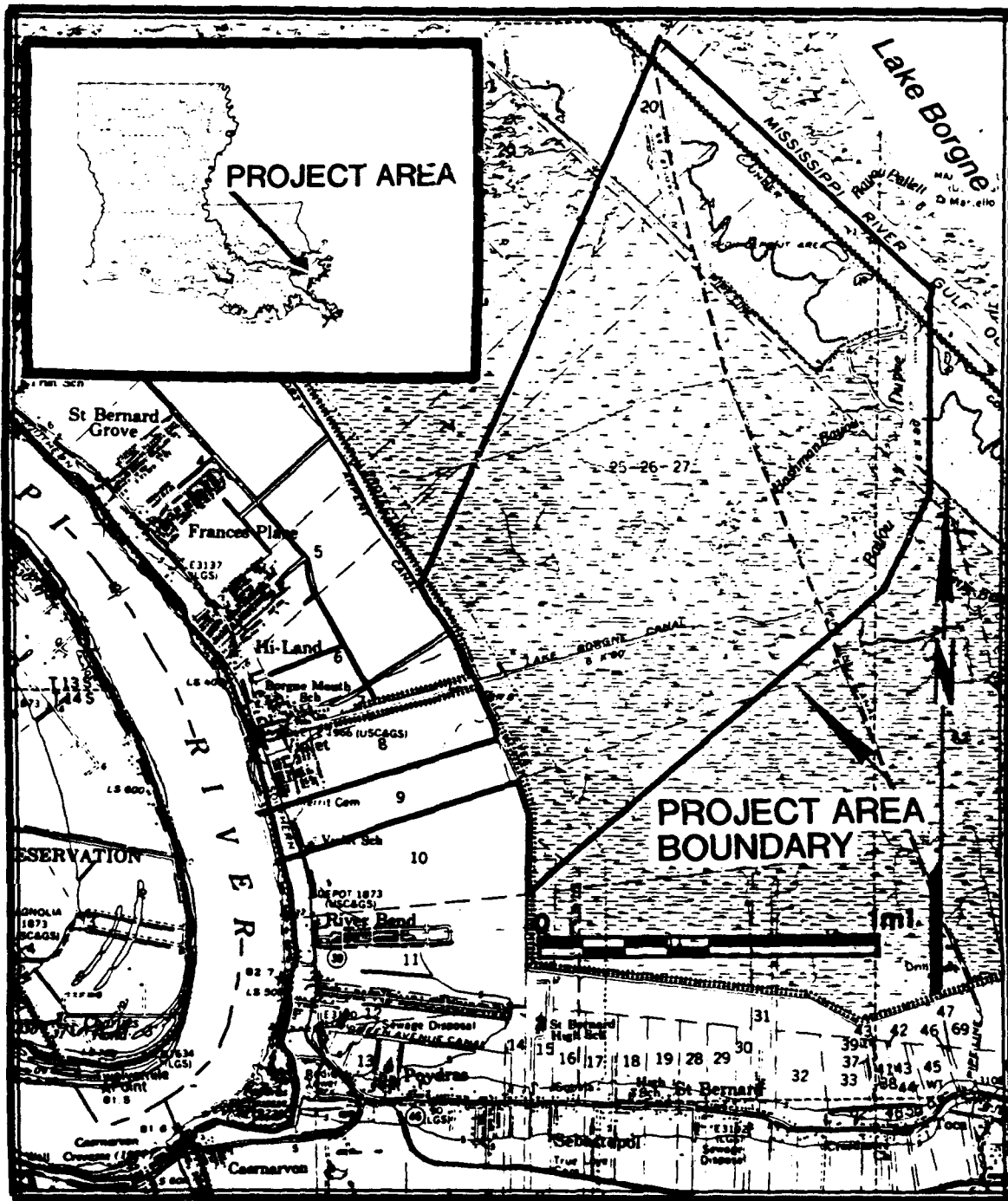


FIG. 1: Location of Project Area

temperature is 21 degrees centigrade (70 degrees F.), with a mean low of 11 degrees centigrade (52 degrees F.), occurring in January, and a mean high of 29 degrees centigrade (84 degrees F.), occurring in July. The growing season exceeds 260 days (White et al. 1983: 103).

Hurricanes and storm surges occur from time to time, and these strongly influence the floral, faunal, and human communities.

Hurricanes and tropical storms are characterized by low barometric pressure and high, usually destructive, winds. This results in a significant rise in sea level. In conjunction with winds of up to 200 or more km/hour, storm surges as great as 7 m (23 ft) can drive ocean water a considerable distance inland. The flooding problem is aggravated by accompanying tropical rains (Bahr et al. 1983: 23).

Floral communities:

In the era before cultivation and urbanization, the natural levees of the Mississippi River would have been characterized by a hardwood forest habitat. Chief trees would have been the Virginia live oak (*Quercus virginiana*), the water oak (*Quercus nigra*), the black willow (*Salix nigra*), hackberry (*Celtis laevigata*), sweetgum (*Liquidambar styraciflua*), and persimmon (*Diospyros virginiana*). As one leaves the natural levees and enters the hardwood bottoms, vegetation includes many of the species of trees already mentioned, but also such common shrub species as the palmetto (*Sabal minor*), green haw (*Cretagus viridis*), and possum haw (*Ilex decidua*). Within forest gaps, elderberry (*Sambucus canadensis*) and French mulberry (*Callicarpa americana*) may be found. Introduced species such as the camphor tree (*Cinnamom camphora*) are also present.

Vines in the hardwood habitat include poison ivy (*Rhus toxicodendron*), Virginia creeper (*parthenocissus quinquefolia*), supple-jack (*Berchemia scandens*), peppervine (*Ampelopsis arborea*), muscadine (*Vitis rotundifolia*), and hemp weed (*Mikania scandens*). There is little or no herbaceous ground cover.

The swamp between the natural levee and the marsh is dominated by bald cypress (*Taxodium distichum*), and water tupelo (*Nyssa aquatica*) is frequently either a sub- or co-dominant species. Red maple (*Acer rubrum* var. *drummondii*) and ash trees (*Fraxinus* spp.) represent the other sub-dominants in this community. Shrubs include wax myrtle (*Myrica cerifera*) and button bush (*Cephalanthus occidentalis*), while vines are greenbriar (*Smilax* spp.), trumpet creeper (*Campsis radicans*) and poison ivy (*Rhus Toxicodendron*). Herbacious cover includes smart weed (*Polygonum* spp.), members of the water plantain group (*Sagittaria lancifolia*), and water hyacinth (*Eichornia crassipes*).

The next, and last, environment within the project area is that of marsh. The distinction between a marsh and swamp rests upon the absence of trees in the former.

Salinity of the marsh will vary from freshwater to salt water, depending on several factors.

Freshwater marsh is inhabited by water plantains (*Sagittaria lancifolia*), while marshhay cord grass (*Spartina patens*) characterizes brackish water marsh. Saline-type marsh environments are inhabited by such flora as oystergrass (*Spartina alterniflora*), Needle rush (*Juncus roemerianus*), and saltgrass (*Distichlis spicata*).

Faunal communities:

The area along the Mississippi River is today highly urbanized and species found there are those adapted to modern life (e.g., rats and mice). In earlier times, though, the riverbank and the natural levee were homes for a variety of animal types, of virtually all classes, from mammalia to reptilia. Even today, most of these groups are still found in the swampy and marshy portions of the study area. Important mammalian species included the deer (*Odocoileus virginianus*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), gray squirrel (*Sciurus carolinensis*), red squirrel (*Sciurus niger*), swamp rabbit (*Sylvilagus aquaticus*), skunk (*Mephitis spp.*), red wolf (*Canis niger*), bobcat (*Lynx rufus*), cougar (*Felis concolor*), and black bear (*Euarctos luteolus*).

Reptiles would also have been plentiful, and would have included the alligator (*Alligator mississippiensis*), the eastern box turtle (*Terrapene carolina*), and a vast array of snakes, from water moccasins (*Agkistrodon piscivorus*) to watersnakes (*Nerodia rhombifera*). A number of frogs would have comprised the amphibian community, notably the bullfrog (*Rana catesbiana*), which may have been a human food source.

Birdlife is also rich in this area, and as might be expected, waterbirds were among the most numerous types. Ducks would have abounded, including the mallard (*Anas platyrhynchos*), the American pintail (*Anas acuta*), and the blue-winged teal (*Anas discors*). Also present were the great blue heron (*Ardea herodias*), the Great egret (*Egretta alba*), and the snowy egret (*Egretta thula*).

Fish, naturally, were widely available as a food source. Many varieties of fresh and salt water fish would have been found in the Mississippi River and/or in the swamp in ancient times, and no doubt many are still to be found in the swamp today. In this area are the sunfish (*Lepomis micromicholophus*), the bluegill (*L. macrochirus*), the alligator gar (*Lepisosteus spatula*), the largemouth bass (*Micropterus salmoides*), the channel catfish (*Ictalurus punctatus*) and the blue catfish (*Tetalurus fureatus*).

Bivalves such as the American oyster (*Crassostrea virginica*) and the brackish water clam (*Rangia cuneata*) were significant food resources in the area. Many factors contribute to the natural distribution of these species, but certainly one of the most important is the salinity of the water. Oysters, of course, require a saline environment,

while *Rangia* are brackish water creatures and can be found in areas of less salinity. The shell remains of both, however, are often associated with prehistoric archaeological sites in coastal Louisiana (Kniffen 1936; McIntire 1958; Neuman 1977).

CHAPTER THREE:

GEOMORPHOLOGY OF THE PROJECT AREA

by

L. D. Nakashima and J. Mossa

Introduction

This section concerns the geomorphology of the proposed corridor for the Violet Site Alternative, New Lock and Connecting Channels, St. Bernard Parish, Louisiana. The proposed project is located in a section of the Mississippi River delta plain which was deposited only a few thousand years ago and where, currently, deterioration by environmental processes is dominant. The description of the geomorphology is part of a multi-disciplinary research design to locate and evaluate cultural resources in the proposed project area.

Geomorphic Processes of the Mississippi River Delta Plain and Project Area:

The geologic history of the project area has been strongly influenced by sea level fluctuations in the Gulf of Mexico and the shifting of the Mississippi River and its distributaries. About 35,000 to 40,000 years ago, the environment of the project area was similar to that a few miles offshore of the modern Louisiana shoreline in the Gulf of Mexico, and thus was characterized as nearshore marine. During the late Wisconsinian or latest Pleistocene deglaciation, when the sea level was approximately 300 ft. (90 m) below present, the Mississippi valley became deeply incised within coastal plain sediments (Fisk 1944). The earliest mid-Wisconsinian nearshore zone and seafloor were exposed to subaerial weathering and developed well-oxidized and consolidated soils. Sea level began to rise persistently after the glacial maximum, between 20,000 and 17,000 years before present.

Deltaic development of the Holocene Mississippi River began when sea level began to slow. The delta plain consists of six major Holocene delta complexes, each initially experiencing a constructive phase and then undergoing a destructive phase. Some evidence indicates that older complexes and lobes are also buried by these six younger delta complexes. Four of these complexes, the Maringouin, Teche, St. Bernard, and

Lafourche, are in various stages of deterioration, while two of these, the modern and Atchafalaya, are actively prograding or outbuilding (Figure 2). Each major course or belt of the Mississippi River, which shifted to a channel with a steeper gradient every 1000 to 1500 years during the Holocene, is associated with a delta complex. The individual lobes within each complex are the products of distributary networks (Frazier 1967). Subdeltas are important components of the delta lobes which, in turn, are the components of delta complexes. Subdelta deposits vary in areal extent from small splays, to minor subdelta, to major subdeltas.

The constructive phase begins when a platform is developed as sediments are dispersed and deposited onto the inner continental shelf. The platform is built up by flooding, with flood deposition being thickest adjacent to the channel or distributary. Sediments deposited during overbank stages on the outside of bends form natural levees, alluvial ridges composed principally of fine sand and silt which slope away from the river. Natural levees coalesce and increase in elevation with increased time of meander belt occupation. As the natural levees build up, they confine increasingly higher amounts of water until only high floods are capable of overtopping the levees and providing flow to backswamp areas. Vegetation growth increases in backswamp areas once the floodplain stabilizes, and organic peat accumulates more rapidly. Fine sand and silt may also accumulate in crevasse splays, deposited in clayey or mucky backswamp and marshes when levees are breached during floods.

St. Bernard Parish, which was formed predominantly by the St. Bernard delta, is part of this process and is currently in an intermediate state of deterioration. Spatial patterns of coastal land loss are largely dependent on the local geology and human-induced alterations. Driving forces of wetland loss include sea level rise, geological subsidence, reduced sediment supply, catastrophic events, hydrologic modifications, human activities, and biological changes. Land loss rates in 1980 in the Parish were about 0.1% per year to 0.5% per year of the total acreage or about 1695 acres per year (Gagliano et al. 1981).

Subsidence in the project area is caused by a variety of processes including relative sea level rise, sinking of Pleistocene and older sediments, compaction of deltaic sediments from the weight of natural levees (Kolb and van Lopik 1958; Adams et al. 1976). Kolb (1958) suggests that the single most important cause of subsidence in this region is the consolidation of high-water content prodelta clays.

In recent years, numerous scientific investigations have attempted to quantify subsidence and sea level rise rates. Kolb and van Lopik (1958) suggest a combined subsidence and sea level rise of 0.8 ft/century for the delta plain south of English Turn. Saucier (1963) determined an overall rate of 0.4 ft/century for the Pontchartrain basin. Watson (1982) determined from benchmark data that subsidence was 1.3 ft/century. Ramsey and Moslow (1987) estimated from tide gage data that relative sea level rise in

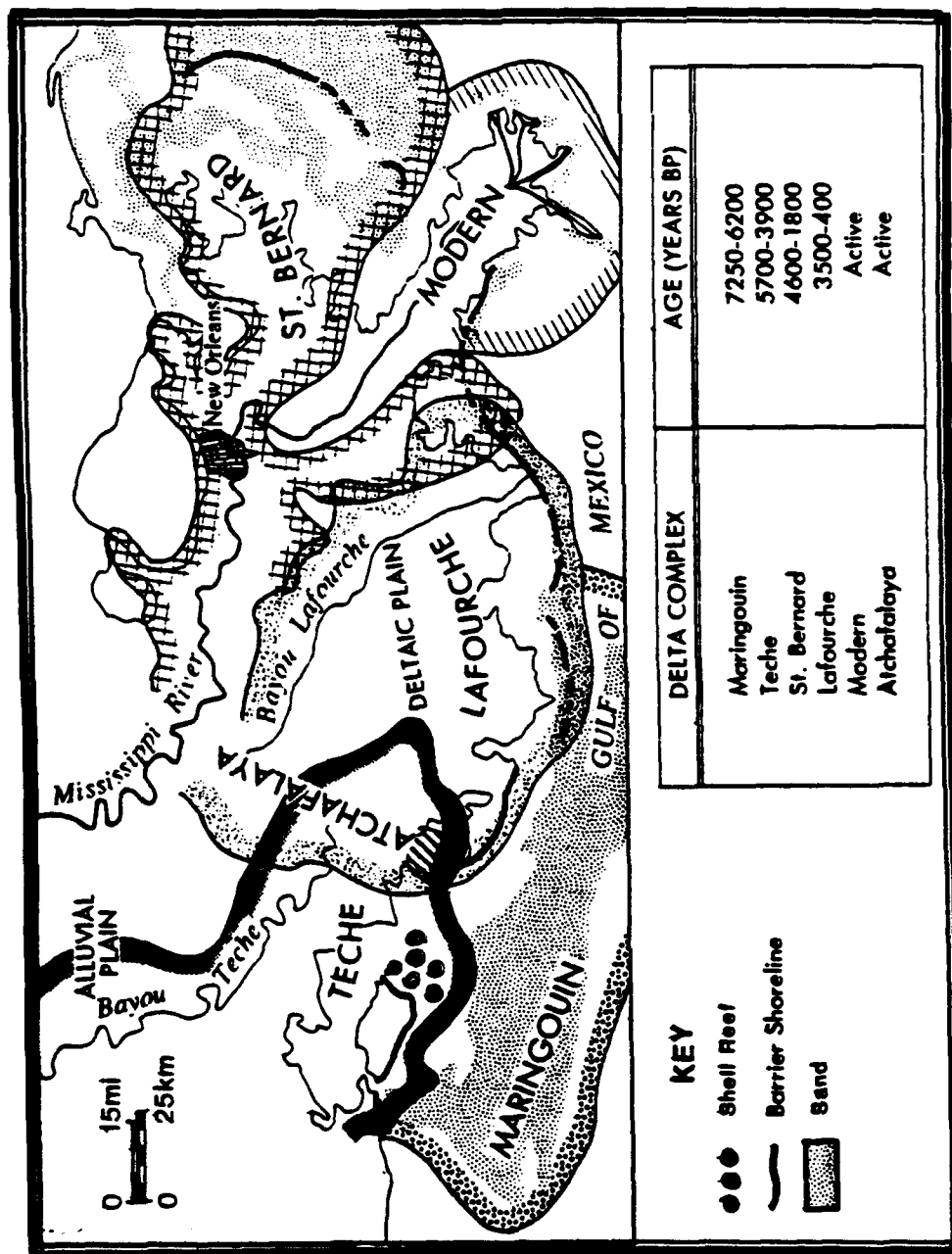


FIGURE 2: Holocene delta complexes of the Mississippi River delta plain (after Frazier 1967).

St. Bernard Parish ranged from about 0.2 to over 0.4 in/yr (0.5 to 1.0 cm/yr) from 1962 to 1982.

Sediment supply to wetland areas has diminished due to the construction of artificial levees along the Mississippi River, and sediment load had decreased in the Mississippi River because of increased diversion of flow into the Atchafalaya River, and the construction of reservoirs and increased use of soil conservation practices upstream (Keown et al. 1986). Shoreline erosion is largely influenced by storm impacts along much of the St. Bernard Parish coast. Canals constructed for oil and gas recovery, navigation, and drainage contribute to land loss because of changes in hydrology and sedimentation, and because of saltwater intrusion which may damage vegetation.

Geology and Geomorphology of the Project Area

The proposed project is located south of Violet in the vicinity of river mile 83 on the east or left descending bank of the Mississippi River Gulf Outlet (MRGO) in St. Bernard Parish, Louisiana. In the proposed project area, elevations range about 15 ft above sea level on artificial levees adjacent to the Mississippi River to a few feet below sea level in the backswamp and in drained areas.

The Mississippi River Gulf Outlet is a man-made waterway on the eastern edge of the proposed project area. The section within the project area, on the south shore of the MRGO, includes a spoil bank which separates the Breton sound basin from the Pontchartrain basin. Recent studies of the project, authorized in 1956 and undertaken in 1958, have concluded that it has brought on a litany of environmental problems (Howard et al. 1984). These include habitat change, wetland loss, and shoreline erosion (Wicker 1980; May and Britsch 1987), and possibly elevated storm surge.

Near-surface deposits in the project area are a product of the St. Bernard delta complex and the meander belts associated with St. Bernard and Modern delta complexes of the Mississippi River (Figure 2; Figure 3). The St. Bernard complex ranges in age from 4600 years B.P. to about 1800 years B.P. (Frazier 1967). The Plaquemine-Balize delta complex initiated approximately 950 years B.P. and is actively prograding at present.

Abandonment of the St. Bernard delta initiated the deterioration phase of the project area. The seaward edge of this lobe was eroded through wave, tides, and currents. Marine processes, in conjunction with extensive subsidence, split the abandoned delta into a barrier island system, the Chandeleur Islands, and a deteriorating inland marsh area which includes the project area. Sediment input from distributaries was minimal, and increased subsidence introduced organic detritus into the interdistributary basin, thereby allowing for marsh formation. With continued subsidence, saline water encroached from the Gulf, causing wetland loss and habitat changes.

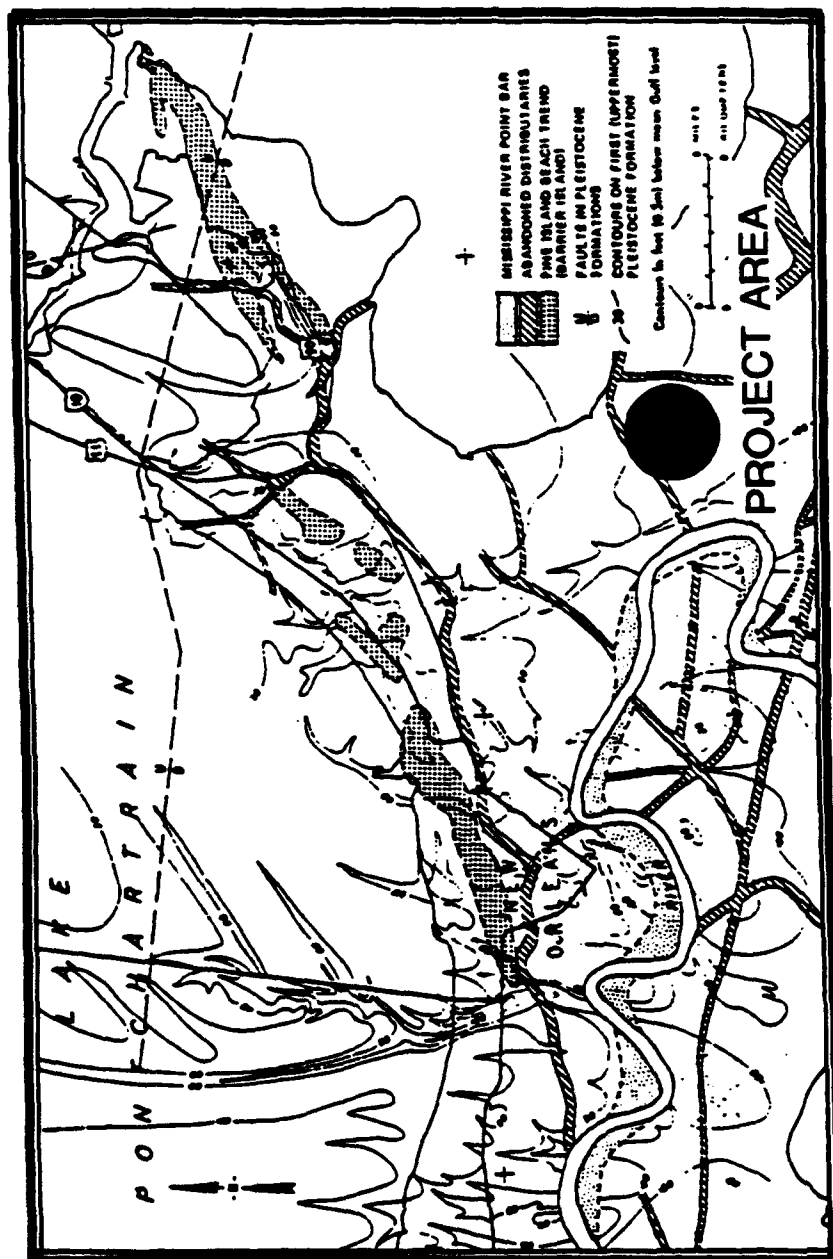


FIGURE 3: Generalized geology of New Orleans and the project area (from Kolb, Smith, and Silvia 1975; and Kolb and Saucier 1982).

Most of the original landmass of the St. Bernard delta has been replaced by the Chandeleur Sound. The remaining landmass is largely saline marsh, interspersed with numerous bayous and bays. There are also areas of fresh marsh, brackish marsh, and freshwater swamp in the region.

Land loss in recent years in the proposed project area has occurred particularly along the MRGO (Figure 3). Saltwater intrusion and impact of ships traveling through the MRGO are contributing factors (Howard et al. 1984). Land loss includes the area of the outlet itself and erosion in excess of 100 ft along sections of its banks since construction. Several "hot spots", or areas of extensive land loss, without obvious causal explanation occur in the vicinity of the project area (May and Britsch 1987). One such area averages 7500 ft long and 3200 ft wide (Figure 4). Sites that were previously onshore, such as the Martello Castle site (16SB85), are presently located offshore and are not accessible by land. Sea level has risen since the late Wisconsinian deglaciation and subsidence has been an active process since abandonment of the St. Bernard delta. These factors have undoubtedly led to the destruction, burial, or submergence of a number of archaeological sites. A comparison of the paleogeography in the vicinity of the project area from about 3500 to 4000 years before present (Figure 5), 2600 to 2800 years before present (Figure 6), 2000 to 2400 years before present (Figure 7), 1400 to 1800 years before present (Figure 8), 600 to 1400 years before present (Figure 9), 300 to 600 years before present (Figure 10) and the present conditions (Figure 11) shows the geomorphic changes in the vicinity of the project area.

The Mississippi River has migrated in the proposed project area (river mile 84.5 to 83.5 above the head of Passes) at a rate of about 3.5 ft/yr (Torrey 1988) (Figures 12 and 13). Between the 1879-94 and the 1973-75 hydrographic surveys, the river has migrated as much as 350 ft eastward. If this trend began much earlier, then some of the sites that were located adjacent to the river may presently be destroyed or submerged. Stratigraphic studies may prove useful for finding buried land surfaces, as on the convex side of the meander bend.

Bayou Dupre is one of several bayous that drains into Lake Borgne in the vicinity of the project area. It is not reported to be a distributary of the Mississippi River (i.e. Saucier 1963; Frazier 1974). Instead, it and other bayous are probably local tidal channels in the interdistributary area that drain the marsh in the vicinity of the proposed project area. This relationship is supported by Saucier (1963), who shows its development on paleogeographical maps (Figures 7 and 8), implying that its development succeeded 2000 years before present. It has gradually expanded since then. Lake Borgne Canal is not shown as an area of land loss on the 1932 to 1983 atlas (May and Britsch 1987); it was constructed in 1900 by enlarging parts of a preexisting canal (Iroquois Research Institute 1982: 107). However, in the backswamp between Forty Arpent Canal to Lake Borgne, Lake Borgne Canal and Bayou Dupre have expanded by as much as 200 ft along each bank.

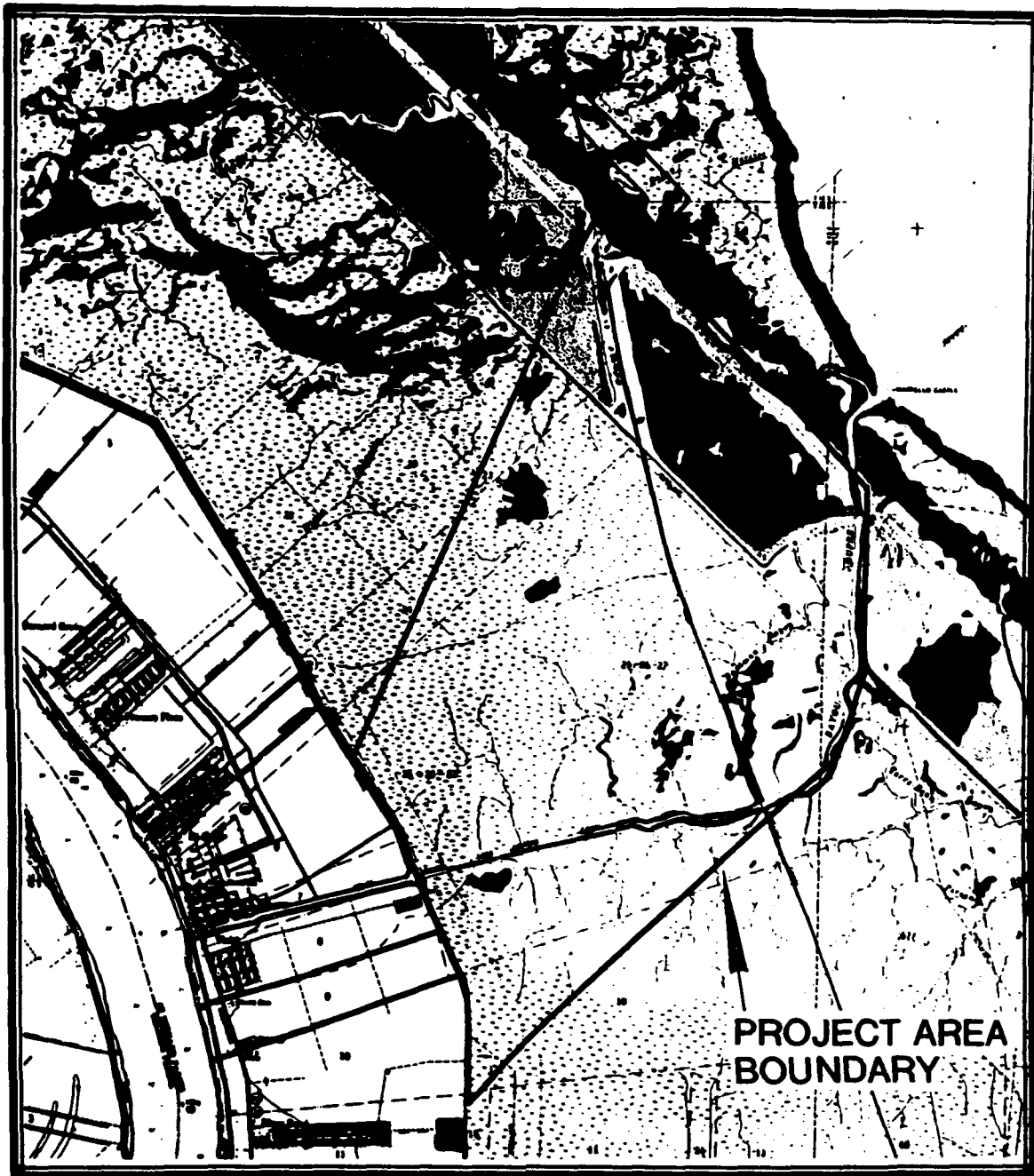


FIG. 4: Land loss in the project area (from May and Britsch 1987). Black areas represent areas of land loss between 1932 and 1983.

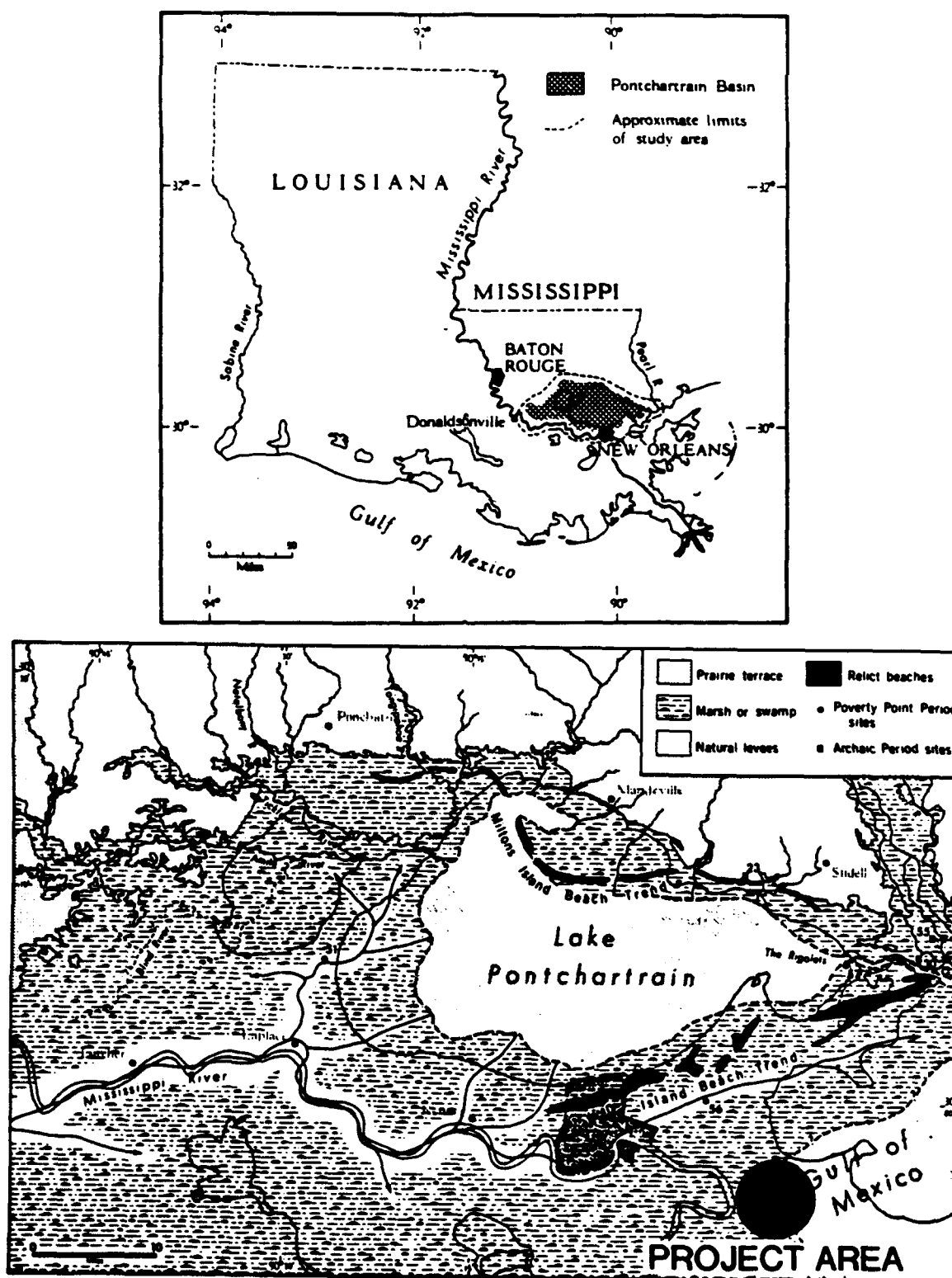


FIG. 5: Paleogeography of the project area, about 3500 and 4000 years before present, showing maximum extent of the early St. Bernard delta and locations of Poverty Point and Archaic period sites (from Saucier 1963)

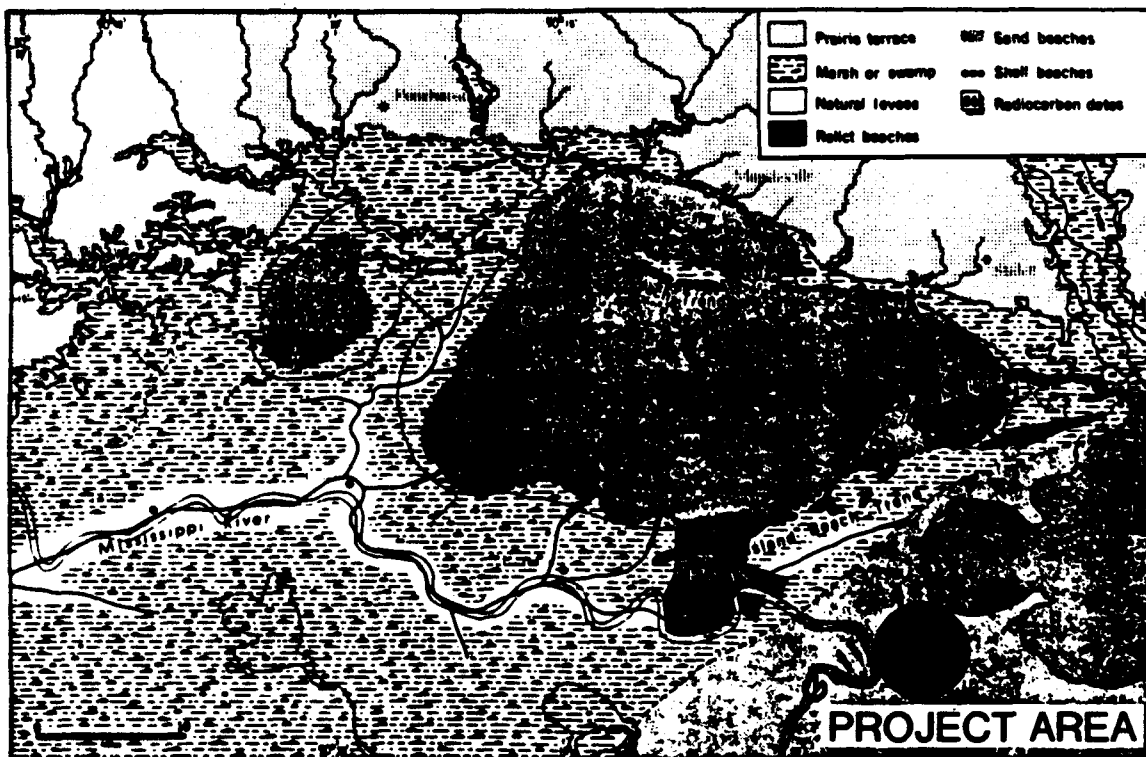
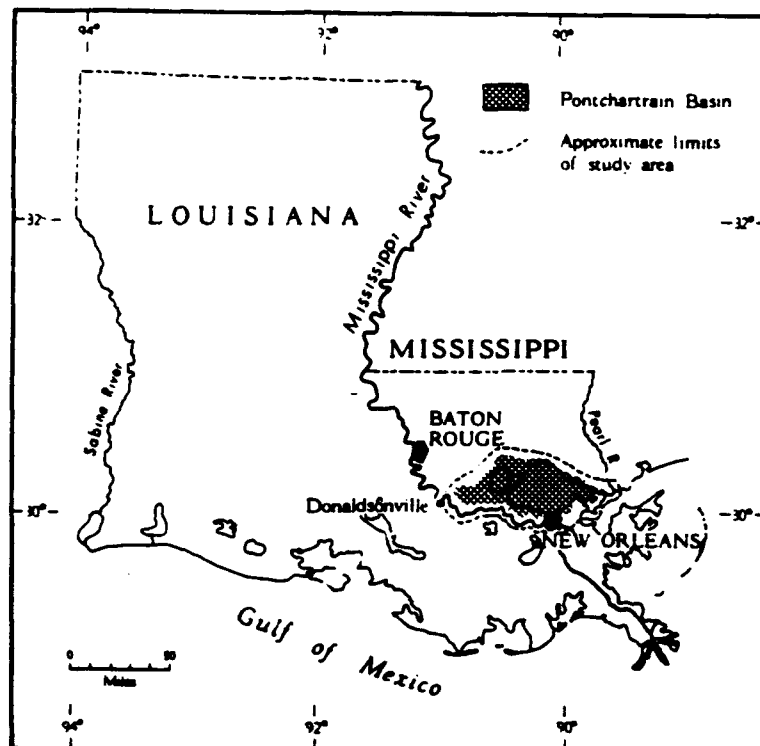


FIG. 6: Paleogeography of the project area, about 2600 to 2800 years before present, showing maximum deterioration of the early St. Bernard delta (from Saucier 1963).

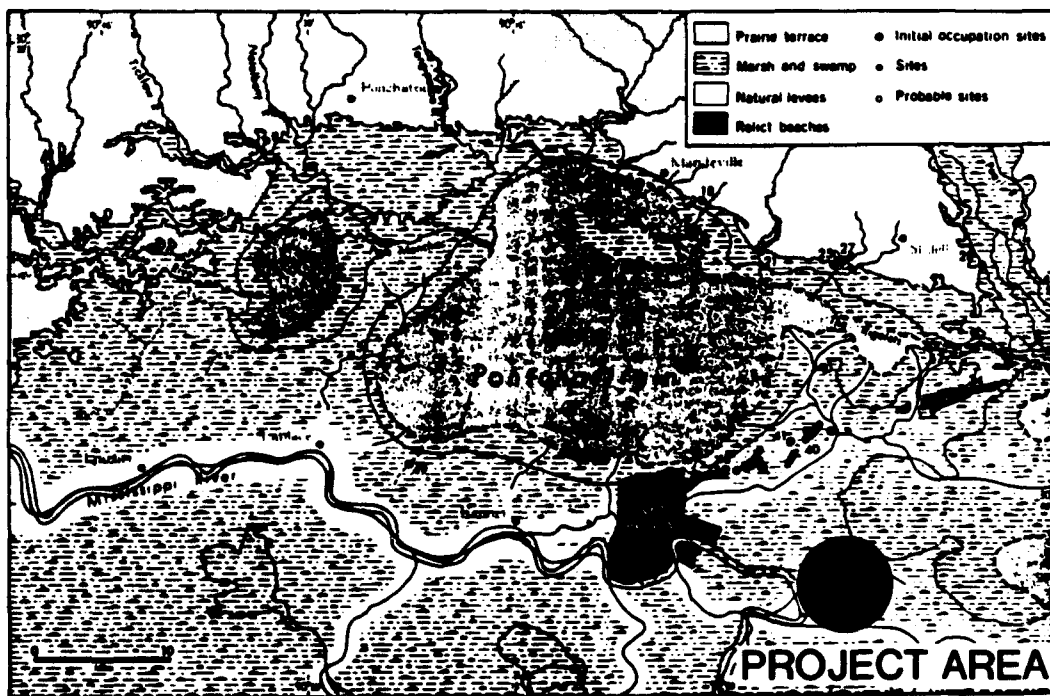
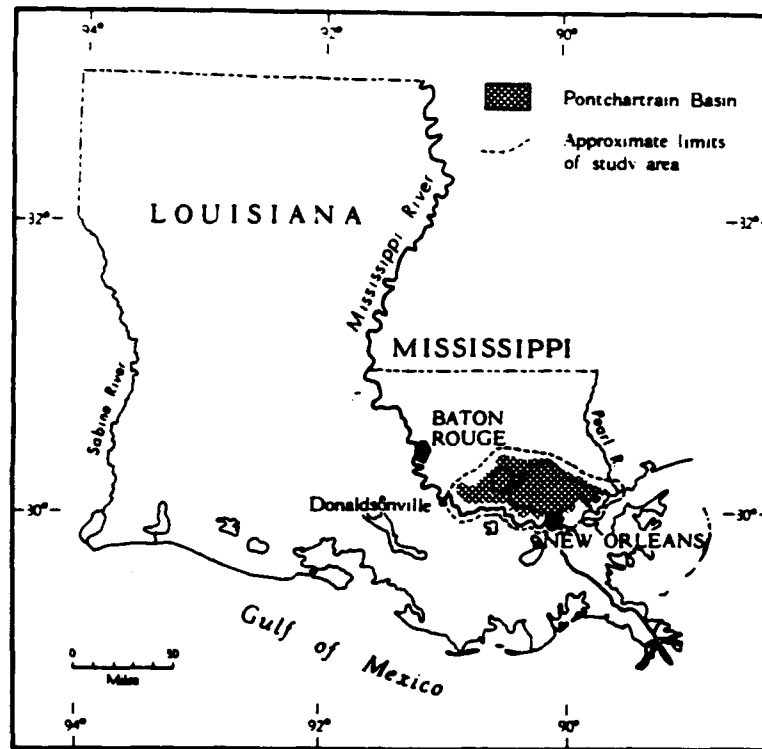


FIG. 7: Paleogeography of the project area, about 2000 to 2400 years before present, showing maximum extent of the late St. Bernard delta and locations of Tchefuncte period sites (from Saucier 1963).

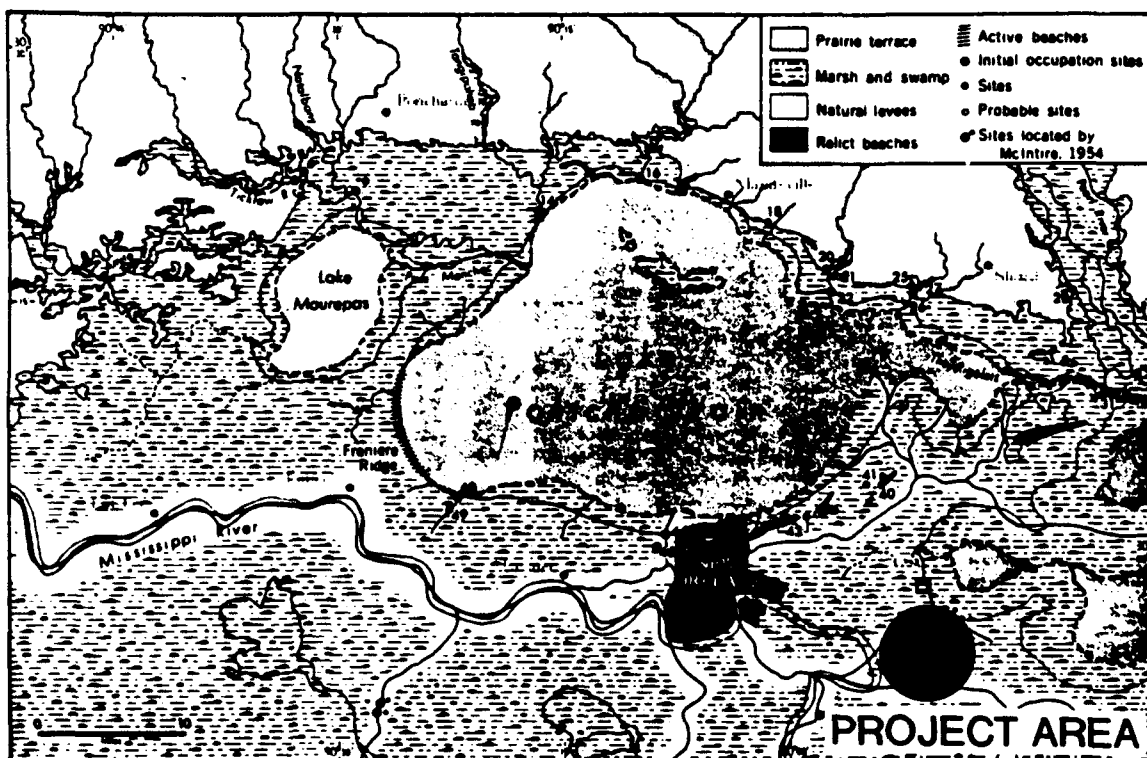
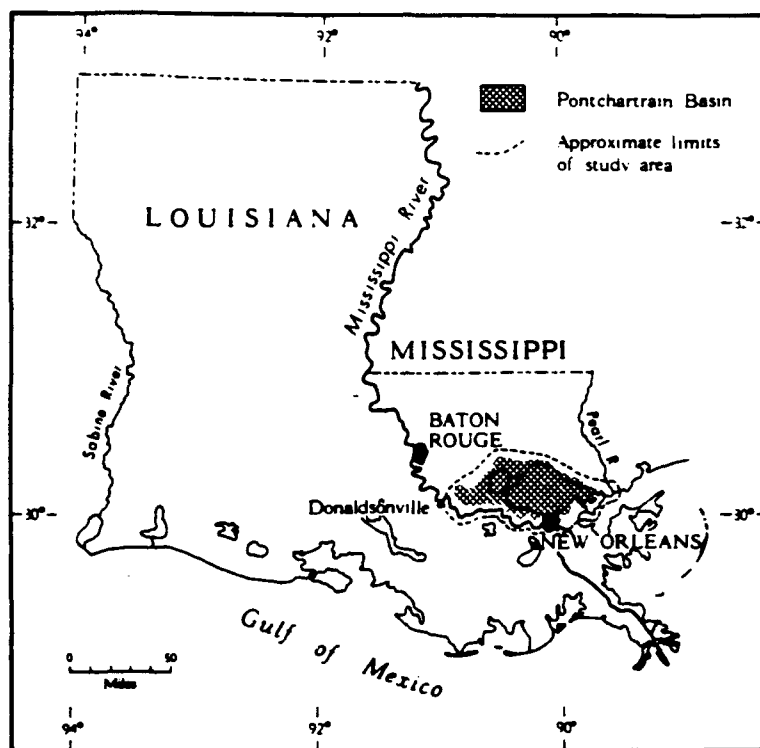


FIG. 8: Paleogeography of the project area, about 1400 to 1800 years before present, including locations of Marksville period sites (from Saucier 1963).

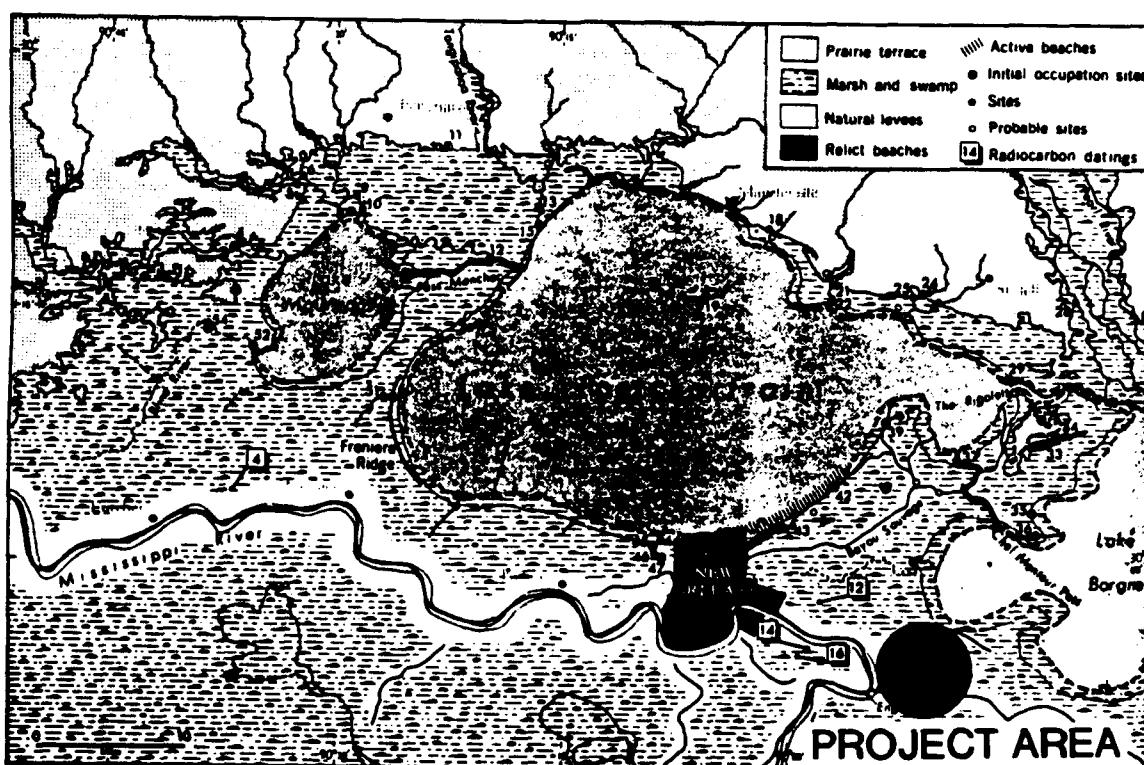
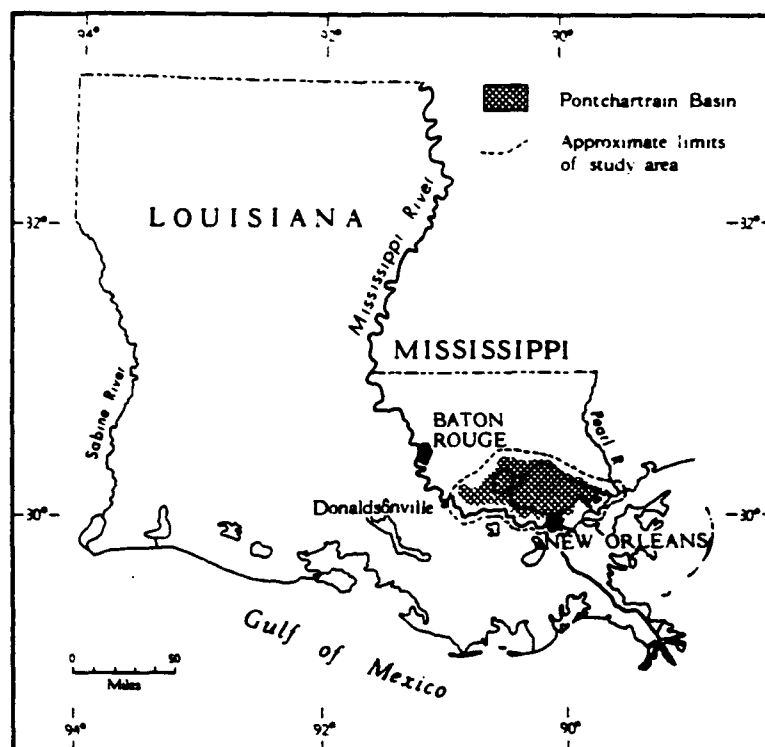


FIG. 9: Paleogeography of the project area, about 600 to 1400 years before present, including locations of Troyville-Coles Creek period sites (from Saucier 1963).

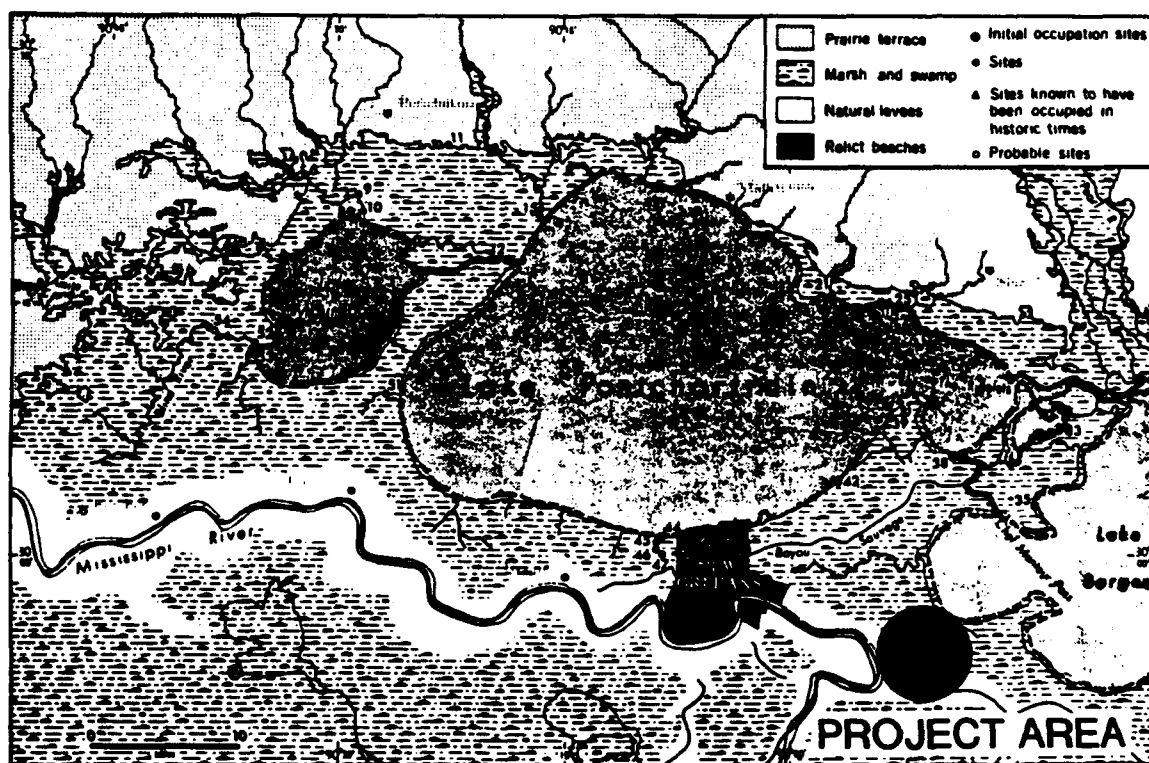


FIG. 10: Paleogeography of the project area, about 300 to 600 year before present, including locations of Plaquemine-Historic period sites (from Saucier 1963).

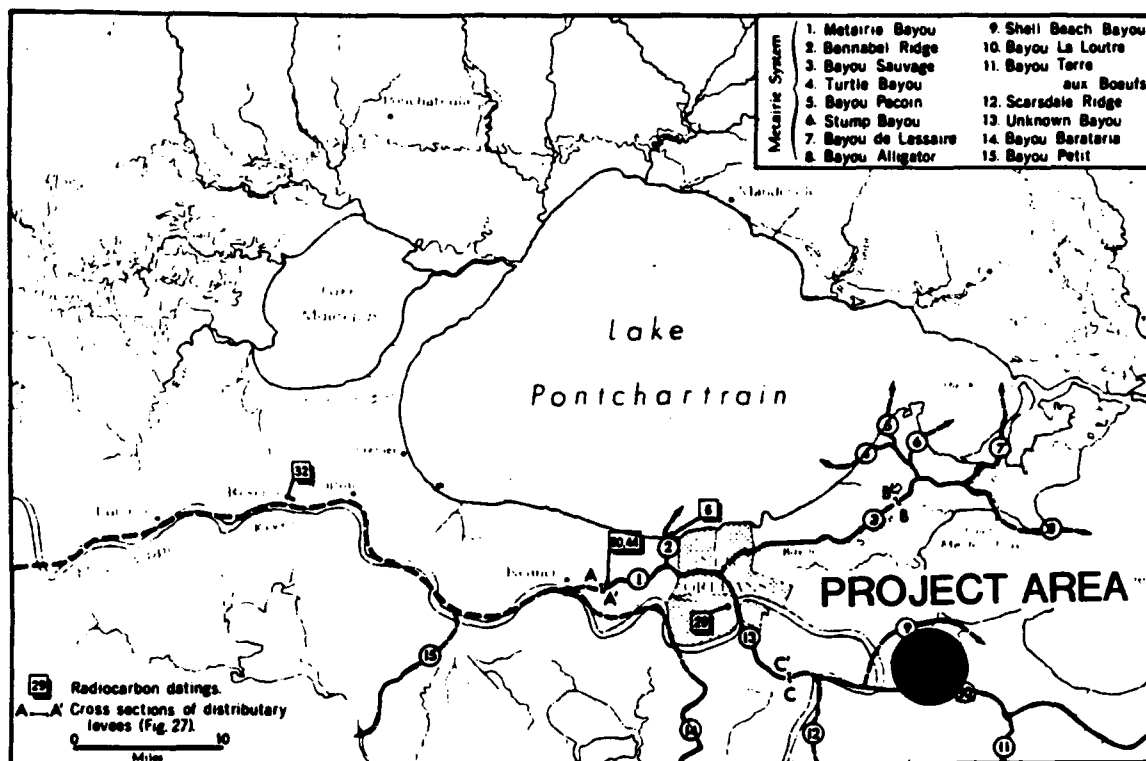


FIG. 11: Locations and name of the St. Bernard delta distributaries and local geographic features (from Saucier 1963).

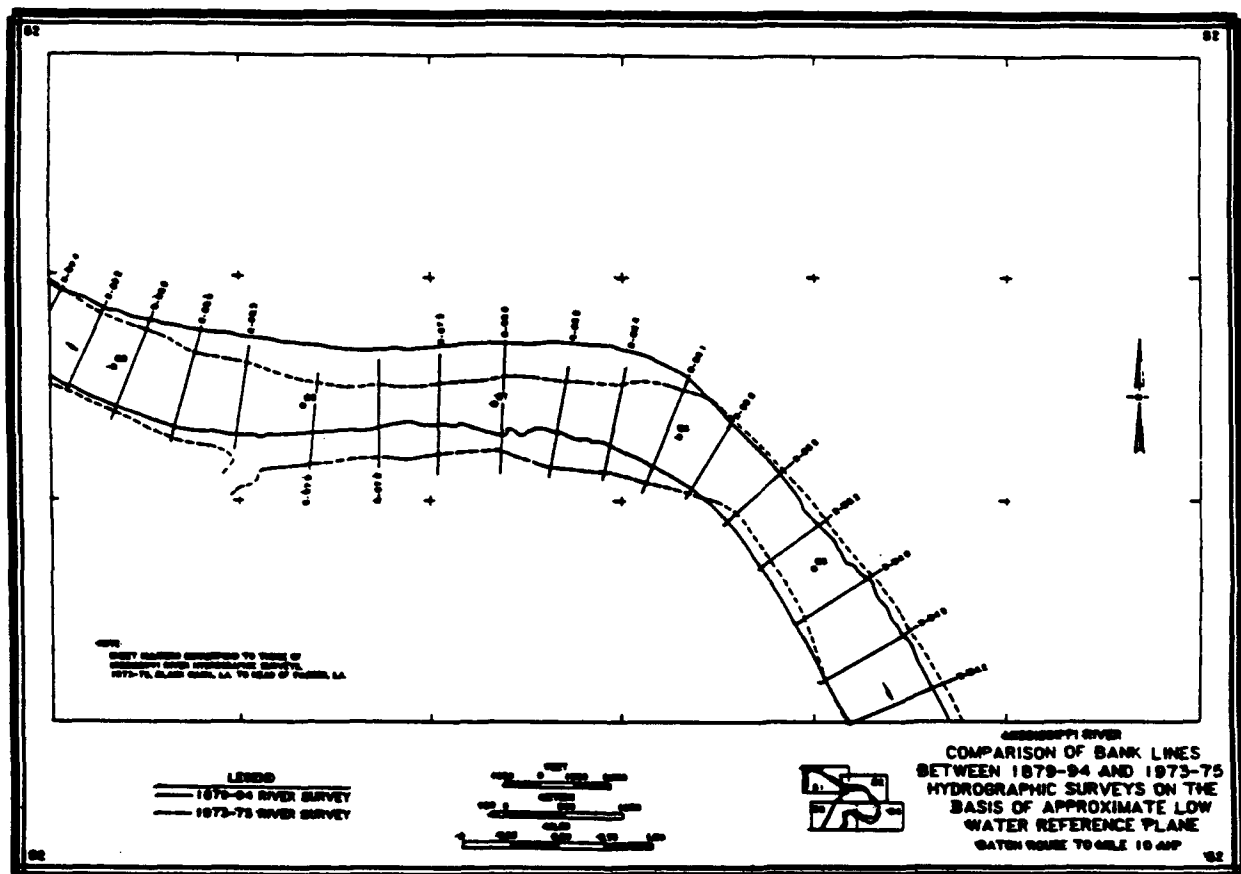


FIG. 13: Comparison of bank lines between the 1879-94 and the 1973-75 hydrographic surveys on the basis of approximate low water reference plane between miles 84.1 and 79.2 AHP (from Torrey 1988).

The project area is presently subsiding rapidly. Depth of burial of archaeological sites would be dependent upon their age and the elevation of the surface at the time of burial. Assuming the subsidence rate to be between the values given previously by Kolb and van Lopik (1958) and Saucier (1963), or about 0.6 ft/century, the ground surface in this area should be about 1.5 ft. lower than it was in the mid-18th century.

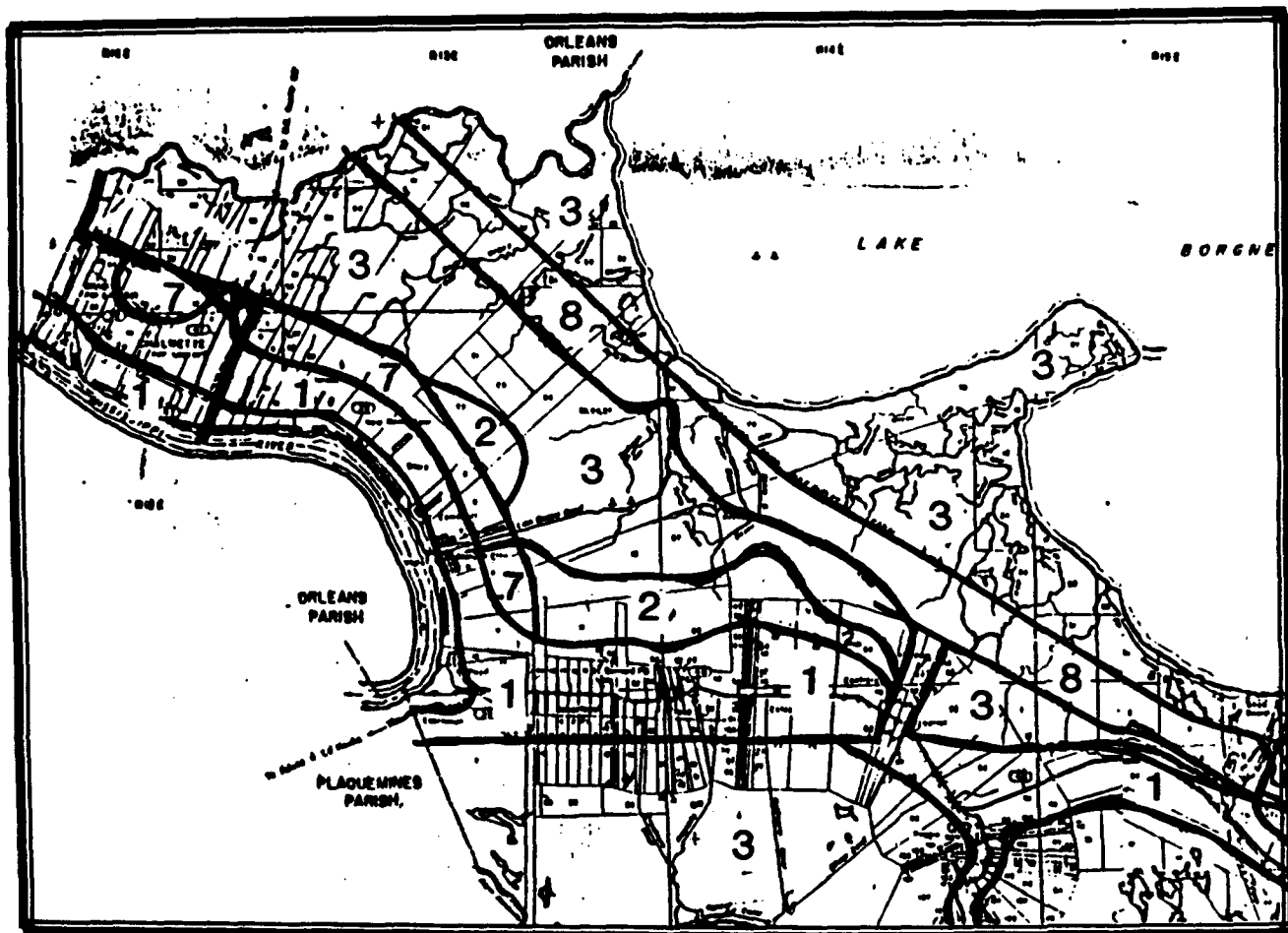
Soil-Geomorphic Characteristics of the Project Area:

The proposed project area traverses the following soil associations from the Mississippi River to the MRGO: 1) Sharkey-Commerce; 2) Barbary; 3) Lafitte-Clovelly; 4) Harahan-Westwego; and 5) unnamed Aquents (USDA, in press). The location of these soil associations in the vicinity of the proposed project area are shown in Figure 14.

The Sharkey-Commerce soils are developed on natural levees adjacent to the Lower Mississippi River in the delta plain. Elevations range from sea level to 15 ft above sea level. The Sharkey series consists of poorly-drained soils formed in clayey alluvium on low and intermediate positions on natural levees. The Commerce series consists of somewhat poorly-drained soils that formed in loamy alluvial sediments developed on intermediate and high positions on natural levees. The Sharkey soils are Vertic Haplaquepts with very fine textures ($>60\%$ clay) and montmorillonitic, with more than half of the clay fraction by weight being made up of expanding-lattice clays. The commerce series are Aeric Fluvaquents with fine-silty textures ($<35\%$ clay and $<15\%$ sand), and mixed mineralogy, where no one clay mineral dominates the clay-size fraction. In St. Bernard Parish, the Sharkey-Commerce map unit consists of about 50% Sharkey soils, 48% Commerce soils, and 2% soils of minor extent.

Barbary soils are developed in freshwater swamps that are frequently flooded and ponded. These are located more distant from the river than the Sharkey-Commerce and the Harahan-Westwego soil associations. Elevations range from sea level to about 2 ft above sea level. In St. Bernard Parish, this map unit is about 98% Barbary soils and 2% soils of minor extent. The Barbary soils are Typic Hydraquents with very fine textures ($>60\%$ clay) and montmorillonitic mineralogy, with more than half of the clay fraction by weight being composed of expanding-lattice clays.

The Lafitte-Clovelly association comprises level, very poorly-drained soils in brackish marshes that have a thick or moderately thick mucky surface layer and are underlain by clayey material. These occur between the backswamp (principally Barbary soils of the Mississippi River) and the spoil banks along the Mississippi River Gulf Outlet. Elevation ranges from sea level to about 1 foot above sea level. In St. Bernard Parish, this map unit is about 53% Lafitte soils, 44% Clovelly soils, and 3% soils of minor extent. The Lafitte soils are Typic Medisaprists that formed in thick accumulations of organic sediments over mineral sediments in saline marshes. The Clovelly soils are



GENERAL SOILS LEGEND FOR ST. BERNARD PARISH (from USDA, in press)

1. Sharkey-Commerce
2. Barbary
3. Lafitte-Clovelly
4. Timbalier-Bellpass
5. Scatlake
6. Fausse
7. Harahan-Westwego
8. Aquents
9. Felicity

FIG. 14: Soil Associations in the vicinity of the project area (USDA, in Press).

Terric Medisaprists, with clayey textures and montmorillonitic mineralogy thick accumulations of organic sediments overlaying clayey river sediments in brackish marshes.

The Harahan-Westwego association is developed in former swamps and marshes, which are level, poorly drained soils that have a clayey or mucky surface layer and have a clayey subsoil. In the project area, the Harahan Westwego association parallels the Sharkey-Commerce association but is more distant from the river. These soils are in former swamps that are protected from most floods by levees and are drained by pumps. Elevations range from sea level to about 3 ft below sea level. In St. Bernard Parish, this map unit is about 73% Harahan soils, 25% Westwego soils, and 2% soils of minor extent. Harahan soils are Vertic Haplaquepts and Westwego soils are cracked, Thapto-Histic Fluvaquents; both have very fine textures (>60% clay) and montmorillonitic mineralogy.

Unnamed Aquents are developed in spoil areas. These occur particularly along the Mississippi River Gulf Outlet in St. Bernard Parish. Elevations range from sea level to about 5 ft above sea level. The soils are level, poorly-drained soils that are stratified and clayey to mucky throughout the profile (USDA, in press).

Relationships of Geomorphology within Human Settlement and Resources:

The natural levee deposits of river and distributaries in the project area (Figure 3) are among the few types of landform suitable for habitation in the modern Mississippi River delta region, although relict/abandoned delta lobes frequently show evidence of past human occupations.

Modern geomorphic processes have destroyed or disturbed several of the prehistoric and historic sites recognized in previous studies. McIntire (1958) reports that many sites surveyed by Kniffen (1936) in St. Bernard and Plaquemines parishes have long since been destroyed by human activities such as road construction and natural processes such as burial by sedimentation, or erosion into lakes, bayous, and the Gulf of Mexico.

Many of the middens and artificial mounds in south Louisiana are presently below the high water mark because of subsidence. The bases of some sites in coastal Louisiana have subsided to a depth of twenty feet due to local consolidation (McIntire 1958).

Specific sites in the proposed project area where human settlements and resources would be concentrated include the modern natural levees of the Mississippi River and along the lakes and other minor water bodies. Evidence from other studies conducted in the vicinity of the project area suggest that natural levees between the Mississippi River and artificial levees have received appreciable overbank sedimentation of about 2 to 4 ft since the eighteenth century (Saucier 1983; Mossa 1989).

It is likely that many of the prehistoric and historic sites in the project area are buried. Remote sensing technologies, including infrared photography and SLAR may be useful in areas where little field work has been conducted. Since elevations in the marsh are fairly level, the remaining subaerial middens and mounds could be detected easily on large-scale photography or imagery. Archaeological field work in the proposed project area should include intensive stratigraphic investigations, particularly along the Mississippi River, where rates of sedimentation are very high.

CHAPTER FOUR:

PREHISTORY OF THE PROJECT AREA

by

Herschel A. Franks and Malcolm K. Shuman

Introduction:

The initial human occupation of Louisiana probably began in the Paleoindian period, perhaps as early as 12,000 years ago (Haag 1971; Neuman 1984). These people hunted now extinct megafauna such as the mastodon and giant bison and lived in bands. Lithic lanceolate projectile points, often with fluting along the sides, are the most diagnostic artifact of this period, though few, if any, have been found in stratified contexts in Louisiana. Those that have been found come from areas of exposed Pleistocene terrace (Smith et al. 1983). In Southeastern Louisiana, virtually the only evidence of Paleoindian occupation stems from Gagliano's work at Avery Island (16IB22) (Gagliano 1967), but Gagliano's interpretations are not without critics (Neuman 1984). It is virtually certain that no Paleoindian occupation will be found in the present study area.

Following the Paleoindian period, and the close of the Pleistocene, there ensues a time of intensive gathering, fishing and hunting of modern species. This period, roughly equivalent to the Mesolithic of the Old World, is referred to in the Americas as the Mesoindian stage or Archaic. The Mesoindian stage is best known in the Southeast through such stratified deposits as that found in Russell Cave, Alabama (Miller 1956), but the geology of Louisiana does not permit many such formations. Consequently, most Mesoindian sites are known from surface scatters, many of which are found on the Pleistocene terraces of the Florida Parishes, to the north of the study area. Naturally, under such circumstances, much remains to be learned about the Mesoindian in Louisiana. In the study area, there is unlikely to be any Mesoindian representation, due to the recency of the land formations.

Following the Paleoindian and Mesoindian stages there ensues a time referred to as the Neoindian era, which is subdivided into a number of discrete periods. The initial period, Poverty Point, is based on the type-site in West Carroll Parish, 16WC5, where the inhabitants, between the years 1,500 and 800 B.C., constructed a gigantic earthwork

Four phases of the Tchula period have been identified for South Louisiana. The Pontchartrain phase is defined on the basis of sites around the edges of Lake Pontchartrain and Lake Maurepas. On the Prairie Terrace surface just to the west, evidence is found for a Beau Mire phase, which is believed to postdate the Pontchartrain phase (Weinstein and Rivet 1978). The Lafayette phase is defined on the basis of sites associated with the old Teche-Mississippi course. In Southwest Louisiana, Tchefuncte sites are attributed to a Grand Lake phase (Gagliano et al. 1979: 4/1-4/3).

Although both inland and coastal plain Tchefuncte sites have been identified within Louisiana, only adaptations associated with the latter are well understood. The closest sites to the present project area that have been extensively excavated are Big Oak (16OR6) and Little Oak (16OR7) islands, along the southeastern shore of Lake Pontchartrain.

Big Oak is a stratified site with two distinct Tchefuncte components. The lowest occupation has a high artifact content but has no shell refuse. Its radiocarbon date is 520 B.C. Above it is a *Rangia cuneata* shell midden, also containing numerous artifacts. Artifacts are primarily Tchefuncte, and the radiocarbon date is 300 to 200 B.C. The Little Oak Island site is 2,000 m east of Big Oak. It is a thin earth midden lying atop a natural shell beach, and has been dated to 215 B.C. Thus, the Little Oak occupation and the shell midden occupation at Big Oak are contemporaneous (Shenkel 1984: 44-46).

The relation between Tchefuncte components at Big Oak and Little Oak provides considerable insight into activity patterning related to subsistence and settlement. The ceramic assemblage (based on pottery types, vessel size, and vessel shape) for the basal Big Oak occupation is most similar to that at Little Oak. Although they are not contemporaneous, both assemblages are derived directly from an earth rather than a shell midden.

These earth midden occupations by Tchefuncte peoples are interpreted as residential. Associated vessels were utilized for cooking and for storage. The shell midden occupation at Big Oak yielded a higher proportion of undecorated vessels than did the contemporaneous earth midden at Little Oak, and the vessels were generally smaller. These utilitarian ceramics were associated with gathering and with transport back to the village site (Shenkel 1984: 49-51).

Faunal analysis confirmed the differential function of these sites. Fresh water drum predominated in both the Big Oak shell midden and the contemporaneous Little Oak earth midden. However, remains of these fish were primarily bony mouth parts at Big Oak, while interneural and dorsal spines predominated at Little Oak. Thus, fish heads were mixed with shell at Big Oak, while fish bones were mixed with other earth midden debris at Little Oak. Apparently, fish were obtained near Big Oak and at least initial cleaning occurred here. Big Oak appears to represent a large-scale faunal processing activity area. Cooking and consumption of these fish then took place at the Little Oak residential

system of six concentric earthen rings half a mile across. The Poverty Point culture established far-flung trade networks, perhaps practiced some form of horticulture, and developed a unique material culture that is perhaps best represented by baked clay artifacts known as "Poverty Point Objects". These items were probably used in earth ovens, to radiate heat (Webb 1982). This culture was widespread throughout Louisiana, Arkansas, and Mississippi, as evidenced by more than 100 documented sites. How or why the Poverty Point culture declined is poorly understood, but it appears that after 800 B.C. the traits that mark this unique culture die out (Webb 1982). Traces of this culture may be found in the study area, but it is unlikely that they will occur as *in situ* deposits. For example, the Linsley site (16OR40) just north of the study area, which was investigated by Gagliano et al. (1975), was evidenced only by *Rangia* shells scattered along a spoil bank. The origin of the cultural materials proved impossible to locate and the site was reported to be essentially destroyed. The recent age of the land surface in the survey area makes it unlikely that any Poverty Point sites found in the study area will be in any better condition, or any easier to locate.

Following the Poverty Point culture is a development known as Tchefuncte. Located primarily in coastal areas, this was the first culture to definitely manufacture ceramics. Originally described as a distinct cultural period by WPA archaeological work in the 1930s, the material remains of this period have often been associated with middens composed of *Rangia cuneata* shells. The earliest date associated with the Tchefuncte culture is about 500 B.C., with A.D. 300 regarded as the latest date. The Tchefuncte culture is itself subdivided into several distinct time periods, and the one that will concern us here is the Tchula period, dated from 250 B.C. to A.D. 0.

The Tchula Period (250 B.C. to A.D. 0):

The Tchula period has been called the "early ceramic period" because, with the exception of fiber-tempered pottery, it was the interval during which initial pottery complexes appeared in the Lower Mississippi valley. Sites are few and scattered, and there are no universal markers. However, within subareas such as South Louisiana, regional markers, primarily Tchefuncte type ceramics, have been identified (Phillips 1970: 7, 8, 15, 76).

People of the Tchefuncte culture were the first to engage extensively in the manufacture of ceramics. Fiber-tempered and some grog-tempered or temperless sherds have been recovered from earlier Poverty Point contexts. These may represent primarily trade goods from the earliest pottery-making cultures to the east. The basic Tchefuncte ware is temperless or grog-tempered, with accidental inclusions of small quantities of sand and vegetable fibre. Sand-tempered wares represent a minority constituent of Tchefuncte site assemblages (Shenkel 1984: 47-48).

center. For the contemporaneous occupations at Big Oak and Little Oak, the three most important dietary constituents, in terms of estimated weight, were fresh water drum (40%), *Rangia* meat (37%) and deer (8%) (Shenkel 1984: 60-61).

Interestingly, Tchefuncte occupations at Big and Little Oak are associated with a well developed lithic technology. Over 100 projectile points have been recovered, as well as unifaces and bifaces, some of which have been worked into special-function tools such as picks and burins. Some ground-stone tools have also been recovered. The source of raw materials for stone tool manufacture is streams flowing into northern Lake Pontchartrain. These are 30 to 40 kilometers from the sites. At Little Oak, primary, secondary, and bifacial thinning flakes are found. This indicates that all stages of lithic reduction were occurring. Occupants must have obtained raw materials either by travelling to streambed quarry sites to the north or by trading. Some exotic stones and some of the bifaces may have been collected from Archaic and Poverty Point sites north of the lake.

Tchefuncte occupations around Lake Pontchartrain and Weeks Island (16IB3) to the west may represent the beginnings of exploitation of the Mississippi River delta and coastal plain. The adaptive strategy developed by Tchula period occupants of the region was then maintained by subsequent populations in coastal Louisiana. Collection of *Rangia cuneata* was a key part of this adaptation (Shenkel 1984: 67).

Virtually all of the post-Tchefuncte sites found in South Louisiana are associated with *Rangia* middens. This clam is most abundant on muddy bottoms which receive occasional influxes of either fresh or salt water that promote spawning. Spring floods and storm surges provide these influxes. In addition to *Rangia*, its predators and aquatic species are represented on these sites.

Big Oak and Little Oak were abandoned at about the time Lake Pontchartrain changed from a brackish to a fresh water environment. This ecological change made the water an unsuitable *Rangia* habitat. Rather than adapt to a new environment, the Indians simply moved. Similar prehistoric cycles of occupation, abandonment, and in some areas, reoccupation, may be related to environmental shifts associated with the evolving Mississippi River delta (Shenkel 1984: 65-67).

The Marksville Period (A.D. 0 to A.D. 300):

The Marksville period is associated with a Hopewellian culture and tradition manifested throughout the Lower Mississippi Valley (Phillips 1970: 7, 17-18, 886). The phase designation for sites in southern Louisiana from the earlier part of this period, and associated with Lake Pontchartrain, is LaBranche. Sites to the east of the present course of the Mississippi River, including the Scarsdale site at English turn (16PL88) and the Magnolia Mound site in St. Bernard Parish (16SB49), are assigned to the somewhat later

Magnolia phase (Phillips 1970: 898-899; Gagliano et al. 1979: 4-19). Late period Marksville occupations in the Barataria Basin are assigned to the Coquilles phase (Beavers 1982: 20-21).

The Hopewell culture's two major centers of development were in Ohio and Illinois, and date to between 200 B.C. and A.D. 400. Diffusion of aspects of the culture may have resulted from the activity of traders who established a wide-ranging network, sometimes termed the "Hopewellian Interaction Sphere." In addition to diagnostic pottery types of the Marksville period, conical burial mounds were characteristic of the culture. Interments are generally associated with grave goods. Some of these were manufactured from exotic raw materials (Neuman 1984: 142-168).

Excavations at the Coquilles site (16JE37) on Bayou des Familles provide the most complete picture of Marksville occupations in southeastern Louisiana below New Orleans. The site is multi-component, and excavations there have yielded data concerning the relationship between Marksville occupations and those of the subsequent Baytown period. Ceramic assemblages from the upper and lower levels of the excavations exhibit differences in the ratio of decorated to plain ceramics and the ratio of stamped to incised designs. From the upper levels, only 9% to 19% of the pottery was decorated, while 30% of the pottery from lower levels was decorated. Also, upper levels showed a higher number of incised designs while lower levels contained more stamped designs (Giardino 1984a: 46-47).

These differences parallel those recorded by Beavers (1982: 23-25) for earlier excavations at the same site. Within some of Beaver's excavation units, a sterile, sandy stratum was interposed between upper and lower components. Absence of this sterile stratum in other parts of the site suggests it may be a result of cultural rather than natural deposition. Nevertheless, the ceramic frequency differences suggest that there was an "earlier" and a "later" occupation of the Coquilles site (Giardino 1984a: 55).

Interestingly, ceramic artifact analyses by Beavers (1982) and by Giardino (1984a) indicated that despite the differences discussed above, the majority of excavated pottery should be assigned to a Marksville period occupation. However, carbon dates indicate that the upper component assemblage actually belongs to the subsequent chronological interval represented by the Baytown period (below). Although ceramic type frequencies change, they do not exhibit sufficient change to indicate the presence of a new cultural tradition. This apparent continuity in ceramic assemblages suggests that at least within the Barataria Basin, late Marksville culture extends into the subsequent Baytown period with few apparent changes in the archaeological record. Similar difficulty in distinguishing late Marksville and Baytown occupations has been encountered elsewhere in the Lower Mississippi Valley (see Phillips 1970).

A radiocarbon date of A.D. 115 was obtained at the base of the mound at Coquilles. Other dates from this feature cluster around A.D. 200. Unlike more "typical" mounds

of the Marksville period, the Coquilles mound has yielded no evidence of burials, prepared floors, or burial platforms. This negative evidence has led to the suggestion that the mound was constructed to improve habitation and refuge conditions in times of tidal surges or heavy floods (Giardino n.d.: 13-14). However, some elderly informants remember the discovery of human burials during the course of the previous shell removal episodes (Giardino n.d.: 13-14). Thus, function of the mound at the Coquilles site remains undetermined.

A house floor within the village portion of the Coquilles site yielded carbon dates of A.D. 280-320, consistent with a late Marksville period occupation. The associated structure was circular, with timbers averaging 6 to 8 centimeters in diameter. Large quantities of daub are evidence of the nature of the constructed materials. A hall-like entrance was oriented toward the southwest. Two infant burials were found almost directly below the wall. This structure represents the only Marksville period house discovered in southeastern Louisiana (Giardino n.d.: 15-17).

The Baytown Period (A.D. 300 to A.D. 700):

The Baytown period has been defined as the interval between the end of Hopewellian/Marksville culture and the emergence of Coles Creek culture. In the southern half of the Lower Mississippi Valley, there are no area-wide horizon or period markers (Phillips 1970: 901).

The Baytown period is often referred to as the "Troyville period" by Delta archaeologists, because of the dearth of diagnostic markers for the period in southeastern Louisiana. It is often assimilated with the subsequent Coles Creek period, and the two are together referred to and discussed as "Troyville/Coles Creek culture" (e.g., Neuman 1984). Gagliano et al. (1979: 4/20) note that the entire eastern coastal zone of Louisiana is subsumed within a single phase, called Whitehall. They consider it likely that work in the Barataria Basin will permit a separate phase designation for that area.

The upper component of the Coquilles site (16JE37) is now attributed to the Baytown period (see below). As discussed previously, almost 35% of all sherds from the lower (Marksville) components of the Coquilles site are decorated, whereas only 7% to 16% of sherds from the upper (Baytown) levels are decorated. This difference may be due to the fact that Baytown period peoples usually decorated only the necks of vessels, a practice that results in representation of a greater proportion of "plain body sherds" in archaeological remains. Other explanations have, however, been proposed. One other difference between Marksville and Baytown period pottery at the Coquilles site is that incised designs predominate in the later period, while stamped designs predominate in the earlier (Beavers 1982a: 22-25; Giardino n.d.: 18-22).

A circular house structure at Coquilles was radiocarbon dated to A.D. 410-450, thereby placing it within the Baytown period of occupation. It is similar to the Marksville period house discussed above, but one major difference has been noted. The Baytown house was constructed with poles that average six to ten centimeters more in diameter than those of the earlier house. Daub, however, was used in the construction of both (Giardino n.d.: 24-25).

Recovery of houses from both Marksville and Baytown periods, and radiocarbon dates ranging from about A.D. 200 to A.D. 570, suggests that a stable village-type occupation was located at the confluence of Bayous des Familles and Coquilles for about 400 years. Although some changes in proportions of ceramic types have been noted, there is continuity between the two assemblages. This continuity appears to reflect long-term and possibly continuous occupation of the site.

The Coles Creek Period (A.D. 700 to A.D. 1000):

The Coles Creek Period is the interval that begins with the emergence of Coles Creek culture in the southern part of the Lower Mississippi Valley and ends with the establishment of "full-blown" Mississippian culture in the northern part of the valley (Phillips 1970: 18). Although it appears to represent a population zenith in the eastern delta province, many sites tentatively classified as Coles Creek may actually be from the Baytown period (Wiseman et al. 1981: 3-5).

Coles Creek culture was characterized by small ceremonial centers with mounds. These were surrounded by villages of varying size. The culture developed in the area between the mouth of the Red River and the southern part of the Yazoo Basin. Its influence filtered into the delta region of southeastern Louisiana (Brown 1984: 95).

Mounds associated with the Coles Creek culture generally are larger and exhibit more construction stages than those associated with the earlier Marksville culture. A more significant difference is that Coles Creek mounds are pyramidal and flat-topped, and they were used as substructures for religious and/or civic buildings. In contrast, Marksville peoples generally built conical burial mounds (Neuman 1984: 167).

In southern Louisiana, generally, the early phase for the Coles Creek period is Bayou Cutler, and the late phase is Bayou Ramos (Brown 1984: 97-99). However, in southeast Louisiana, only the Bayou Cutler phase is recognizable. The type site for the Bayou Cutler phase is Bayou Cutler I (16JE3), located within Barataria Basin (Gagliano et al. 1979: 4/27-4/30). The Bayou Cutler phase, as defined by Kniffen, is identified by an absence of shell-tempering in pottery, presence of lugs or ears on vessel rims, and incised lines on rims, absence of handles on vessels, and a large percentage of check-stamped decoration. Phillips (1970: 921) identified types and varieties that exhibit these characteristics (Wiseman et al. 1981: 4/3, 4/9).

Pontchartrain Check Stamped pottery is the most typical Coles Creek period ceramic of the delta region. Check stamping probably was a utilitarian technique that produced desired results during the manufacture of pottery. Thus, it may not have been solely a decorative style (Brown 1984: 115, 123). Pontchartrain Check Stamped pottery was contemporaneous with similar types being produced in northwest and eastern Florida. This similarity, as well as similarity of rim modes from the three areas during this period, suggests contact between Coles Creek peoples of the Louisiana delta and Gulf Coast occupants to the east (Brown 1984: 115-122). However, ceramic designs also show influence from the Mississippi River alluvial valley (Wiseman et al. 1981: 3/5).

The Mississippi Period (A.D. 1000 to A.D. 1700:

The beginning of the Mississippi period is marked by the emergence of Mississippian culture in the northern part of the Lower Mississippi Valley and Plaquemine culture in the southern part (Phillips 1970: 18-19). The Barataria phase is associated with early Mississippi period occupations within the Barataria Basin (Gagliano et al. 1979: 4.36-4/41). It is the equivalent of the Medora phase as defined by Quimby for the Baton Rouge area.

During the Barataria phase, the "Barataria Complex," as defined by the neighboring sites Fleming (16JE36), and Bayou Villars (16JE68), and Isle Bonne (16JE60), probably reached the height of its importance. Shell middens, shell mounds, earth and shell mounds, and probable extensive habitation areas are represented in this complex. Some sites along the des Familles-Barataria trunk represent small habitation locales and/or special activity areas (Gagliano et al. 1979: 4/45; Yakubik and Franks 1988).

The Bayou Petre phase follows the Barataria phase. It is most strongly expressed in St. Bernard Parish to the east. The final phase of the Mississippi period within the area is termed "Delta Natchezan." It is best represented at the Bayou Goula site (16IV11) to the north and at sites along Bayou LaFourche to the east. Many sites in the Barataria Basin exhibit a mix of Bayou Petre and Delta Natchezan traits so that assignments to either phase are problematic (Gagliano et al. 1979: 4/41).

The Bayou Petre phase, as defined by Kniffen, is identified by a high percentage of shell-tempered sherds, handles on vessels, simple nodes or lugs on rims, undecorated rims, gritty-textured ware, greater use of curvilinear lines and coarser wares than during the Bayou Cutler phase of Coles Creek, and an absence of check-stamped pottery. This list of traits is still applicable, although check-stamped pottery is at least a minority ware in many Mississippi period sites in Louisiana. Type assignments for Bayou Petre wares from the eastern delta are generally the same as those for the eastern Gulf Coast, evidence for contact between the two areas (Wiseman et al. 1981: 4/3-4/4).

The Plaquemine culture itself is sometimes considered to be the classic development of temple mound construction in the lower portion of the Lower Mississippi Valley. However, archaeological excavations demonstrate that it actually represents a late prehistoric development of the preceding Coles Creek culture. Multi-mound construction and artifact assemblages are evidence that link the two. Absence of European trade goods indicates that the Plaquemine culture reached its zenith prior to contact (Neuman 1984: 258-259).

The Medora site (16WBRI), the type site for Plaquemine culture, is located in West Baton Rouge Parish, on Bayou Bourbeaux. It originally consisted of two mounds separated by a 400 foot long plaza. The major mound was completely excavated by Quimby (1951: 88-92) and then restored, and excavations were conducted at other portions of the site.

Excavation of a pre-mound level at Medora uncovered numerous postholes and two rings, one inside the other, comprised of wall trenches and post molds. These were 45 and 25 ft in diameter. Fire pits and a "clay altar" were located within the small ring. Some post molds suggested square structures as well. Wattle-and-daub was apparently the technique of house construction. The larger mound showed evidence of episodic construction, with pits and/or structures on the upper surface of each successive modification. Atop the smaller mound, either one or two structures was located, and these were marked by postmolds and a wall trench (Quimby 1951: 94-101).

The work at Medora recovered 18,508 sherds, of which only 44 were shell-tempered. Paste characteristics in the Plaquemine sherds were uniform. The paste was soft, clay-tempered and poorly fired. Color was variable, but grays and tans predominated. Surface finish was smooth, and had a soft and chalky feel. About ten percent of the collection was decorated. Brushing and incising were the most common decorative techniques, but engraved and punctated sherds did occur. Although this was a single component site, some Coles Creek types occurred, including Pontchartrain Check Stamped. These types exhibited the same or nearly the same paste characteristics as the Plaquemine types, and were considered an integral part of the Plaquemine complex. Further, Plaquemine pottery appeared to be "...an outgrowth of Coles Creek pottery" (Quimby 1951: 123-124, 129).

The Bayou Goula site (16IVII) also yielded data concerning the nature of a Plaquemine occupation in south Louisiana. The site is located on the west bank of the Mississippi River about 25 miles downstream from Baton Rouge. At the time of excavations, two badly eroded mounds were present, separated by a plaza about 600 ft long. The river was about 500 ft from the site (Quimby 1957: 98-99).

The Plaquemine component was represented by two mounds and by artifacts in a thin midden deposit within an old humus level that was lying atop a bed of silt. The midden was beneath four to five ft of more recent alluvium. The mound rested on the

humus layer. The excavated mound showed evidence of three construction phases (Quimby 1957: 104-105, 114-117).

Plaquemine component pottery types from non-mound portions of the site were dominated by Addis Plain, as was the case at Medora. Surprisingly, Pontchartrain Check Stamped was the most frequently occurring decorated type. One shallow depression about three ft in diameter was lined with canes, grass and leaves. Also, a small deposit of fragmentary, burned corncobs was uncovered (Quimby 1957: 105).

Lying above the four to five ft of relatively sterile alluvium was evidence of the historic period occupation of the site by Bayogoulas and other groups. The village had been visited in the late seventeenth and early eighteenth centuries by Iberville and other Europeans, some of whom left descriptions of material culture and of ceremonial activity associated with the mounds. Unlike the Plaquemine component here or at Medora, European goods were found in association with aboriginal wares in this late component which was termed Delta Natchezan (Quimby 1957: 118-119).

European material included trade beads, glass bottle fragments, kaolin pipe fragments, copper and brass ornaments, and various metal items. European ceramics were found but have been described only in a summary fashion as "crockery" and "earthenware." Although Addis Plain dominated ceramic types from the Delta Natchezan occupation, a number of shell-tempered plainware Mississippi plain *var. Fatherland* were the second most frequently occurring, while no sherds of this type were recovered from non-mound portions of the Plaquemine component. This innovation in techniques of pottery manufacture was considered one of the markers for the Delta-Natchezan culture (Quimby 1957: 134-144).

The Buras Mound site (16PL13) in Plaquemine Parish, based on ceramic analysis, also represents a late Mississippi period occupation. It is one of the southernmost aboriginal sites in the Mississippi River delta region. Although it is subsiding rapidly, four mounds arranged around a central plaza were observed in 1981. Buried shell middens are also present (Gagliano and Weinstein n.d.).

Faunal remains from the site include two species of *Rangia* as well as other shellfish, fish, reptile and mammal bones. Floral remains included hackberry, greenberry, walnuts, and charred cobs of maize. The latter were found in a concentrated area. Ceramic analysis indicates influence both from the eastern Gulf area and from the Mississippi River alluvial valley. A relatively high percentage of sherds were shell tempered. Although no European trade goods have been reported, the Buras Mound site may represent a very late prehistoric or early protohistoric occupation in the delta. De Soto's men reported the presence of hostile Indians who still used the atlatl in this vicinity (Gagliano and Weinstein n.d.).

The foregoing should not be taken to imply that our knowledge of the Coles Creek and Plaquemine cultures is complete. Several important sites on the northern border of Lake Pontchartrain may be expected to add substantially to our knowledge of this time, if, in one case, excavation ever takes place, and if, in another, the results of excavation are ever published.

The first location, the Hoover site (16TA5), is to be found on the southernmost edge of the Pleistocene Terrace, overlooking the swamp that borders Lake Pontchartrain, on the north. The site at one time consisted of five and possibly six mounds, although at present only three remain (Jones and Shuman 1988). In its heyday, this site was undoubtedly a major center, and exotic lithic materials are found in abundance. Jones and Shuman surface collected some 31 whole or partial projectile points, ranging from Archaic types to Albas. The ceramic inventory was similarly varied, ranging from Marksville Incised to Plaquemine types.

It would appear, therefore, that the Hoover site was occupied for a long period, reaching its apogee perhaps in late Coles Creek and early Plaquemine times. Interestingly, Jones was able to apply Sherrod and Rolingson's formula to show that an aboriginal measuring unit of 47.5 m, the so-called "Toltec Module," seemed to have been used in spacing the mounds (Sherrod and Rolingson 1987).

Another site of some consequence, also just north of Lake Pontchartrain, is the Shadows Mound (16ST125). This mound, though known for some time, was excavated in 1985-86 by members of the Northlake Chapter of the Louisiana Archaeological Society (Dwyane Lassiter, personal communication). While their investigation indicated that the mound itself was probably constructed during the Coles Creek period, they uncovered what appeared to be three later burials, consisting of two adults and one child. These burials were associated with over 130 trade beads dated between AD 1700-1750. Thus, the mound was apparently reutilized for mortuary purposes during contact times by people who may or may not have been descendants of its builders (Jones and Shuman 1988).

Aboriginal Occupation during the Colonial Period:

Identities and locations of Indian tribes in Louisiana cannot be determined from any period prior to about 1700. At about that time, literate French settlers and visitors began to record their observations regarding aboriginal occupants of the area. Even so, it remains difficult to sort pre- and post-contact culture traits. This is especially true for the lesser tribes living along the Mississippi River and other areas within southeastern Louisiana (Kniffen et al. 1987: 45).

The primary Houma village in 1700 was located near present-day Angola. Iberville reported 140 cabins here, arranged in a circle, and estimated the population to include

350 warriors. The Bayougoula settlement (above), with a population of 400 to 500, clustered around a village near the modern town of Bayou Goula. The Acolapissa lived in six towns along the Pearl River and other streams flowing into Lake Pontchartrain. Their settlement pattern may have been diffuse. After 1700, they moved closer to Lake Pontchartrain, and in 1718 established a village on the Mississippi River above New Orleans (Kniffen et al. 1987: 49-51).

The Quinapisa, who may have derived from the Acolapissa, lived at a village on the right bank of the Mississippi River near Hahnville in 1682. Prior to that, they lived in several villages nearer the mouth of the Mississippi. By 1700 their numbers had diminished, and they merged with the Mugulasha and moved to the Bayougoula village. In an unexplained bout of internecine hostility, numbers of them and the Mugulasha were slaughtered by the Bayougoula. Little is known of the latter tribe, who disappeared from the historic record after the 1700 massacre (Kniffen et al. 1987: 51-52).

Little was recorded concerning the Okelousa. They are thought to have lived on lakes to the west of and above Pointe Coupee. Described as the 'wandering people west of the Mississippi', they formed an alliance with the Houma to destroy the Tangipahoa village. In 1699, the combined population of the Okelousa, Chawasha and Washa was estimated at 700, of whom 200 were warriors (Kniffen et al. 1987: 52-53).

The Chitimacha population in 1650 has been estimated as 4,000. Their tradition indicated a former home in the Natchez area, and the Natchez claimed kinship ties with the Chitimacha. They had settlements on the Mississippi River and Bayou Plaquemine. After the appearance of the French, two divisions of the tribe may have occupied lower Bayou Teche and upper Bayou Lafourche. The Chitimacha are among the lower Mississippi tribes that displayed the highest cultural attainments in the southeast (Kniffen et al. 1987: 53-55).

In 1699, the Washa lived around a central village on upper Bayou Lafourche. However, they ranged widely and utilized the resources peculiar to the Lower Mississippi and Gulf Coast. After the arrival of the French, the Washa moved frequently. Sibley reported that they originally lived in the Barataria area. By 1718 they had established a village on the Mississippi near the Cote des Allemands post. The Chawasha were said by the French to have the same character as the Washa. They also lived on Bayou Lafourche, near the principal Washa village. In 1718, that village was visited by a party of Natchez, Yazoo and Chikasaw who attacked the Chawasha, killed the chief and members of his family, and carried away eleven slaves, one of whom was the chief's wife. After New Orleans was established, the group settled on the West bank of the Mississippi three leagues downstream from the city, just below English Turn. By 1722 they had moved half a league to the south, crossing to the east side of the river (Swanton 1911: 298-301). In 1730 that village was attacked by a group of black slaves directed by Governor Perrier (Kniffen et al. 1987: 55-56).

The protohistoric and early historic periods were traumatic for aboriginal society in southeastern Louisiana. The effects of disease and of the ever-increasing European population are reflected in the declining aboriginal population and in the migration by remnants of various tribes. Internecine warfare typified relations between the various groups (Giardino 1984b).

Louisiana Indians feared and detested slavery more than any other European institution. One Tunica woman was reported to have hanged herself to avoid it. However, Europeans held slaves from a number of tribes. These slaves derived primarily from tribes that had traditionally exhibited hostility toward the Europeans. However, Indians from larger and more militant tribes such as the Caddo, Chickasaw and Choctaw were usually not enslaved (Kniffen et al. 1987: 65).

CHAPTER FIVE:

HISTORY OF THE PROJECT AREA

by

Foster T. Smith

Discovery:

Europeans first learned of the existence of the great river that would be called the Mississippi in 1527. A Spaniard, Cabeza de Vaca, a member of the ill-fated Panfilo de Narvaez expedition to Florida, tasted its fresh water even though he was a few miles out to sea in the Gulf of Mexico. In 1541, Hernando De Soto reached the Mississippi at a point somewhat south of where Memphis, Tennessee now stands. He died shortly thereafter, and was buried in the stream. For nearly a century and a half following the De Soto expedition, Spain left North America untouched, except for the Florida peninsula.

It was left to France, the rising European power in the seventeenth century, to rediscover and occupy the region drained by the Mississippi River. In 1672 two French Canadians, Louis Joliet and Father Jacques Marquette, descended the river to the mouth of the Arkansas. A decade later, another Frenchman living in Canada, Rene-Robert Cavalier, Sieur de La Salle, descended the river all the way to its mouth, completing the process that Cabeza de Vaca had begun 155 years before. On April 9, 1682, in a solemn ceremony on a spot of dry land near the mouth of the Mississippi, La Salle claimed "Louisiane" for France and its king, Louis XIV.

Thus, La Salle was the first European to observe the study area. It was not visited again until 1699 when Pierre Le Moyne, Sieur de Iberville, sailed up the Mississippi River, leading the French party whose mission it was to colonize Louisiana. Iberville, however, chose the eastern shore of the Bay of Biloxi as the site of the first settlement.

Later that year, Iberville sent his 19-year-old brother, Jean-Baptiste Le Moyne, Sieur de Bienville, back to the Mississippi for further exploration. On September 15, 1699, Bienville, with five men in two bark canoes, came across an English corvette of ten guns, commanded by William Lewis Bond. The English ship was anchored in a bend of the river, about 25 leagues above its mouth, awaiting favorable winds to go further upstream. Although heavily outnumbered, Bienville, "sent two men to tell him [Bond]

to immediately leave the country, which was in the possession of the king [Louis XIV], and that if he did not leave, he would force him to," by calling up nonexistent reinforcements located downstream. The English captain fell for Bienville's bluff and abandoned the river (McWilliams 1981: 107).

The bend in the river where this incident took place has been known ever since as English Turn, or, as the French called it, "Detour aux Anglais." The study area is located on the outside bank, the east (or left) bank of English Turn.

Even though there was much French activity in the area for the next few years, permanent settlement did not occur until 1718, when Bienville chose the site of New Orleans at the portage between the Mississippi and Bayou St. John, which flowed into Lake Pontchartrain.

Development:

In 1717, John Law's Company of the West acquired the rights to Louisiana from the French Crown and controlled it until 1731. The following year Bienville founded New Orleans on the left descending bank of the Mississippi River, only about 100 miles from the river's mouth. The Company of the West intended to develop the agricultural potential of Louisiana by granting liberal land concessions to wealthy French citizens who were willing to establish plantations. These concessions generally took the form of large, rectilinear lots that ran from the riverfront to unusable swamp land (Wall 1984: 20-21).

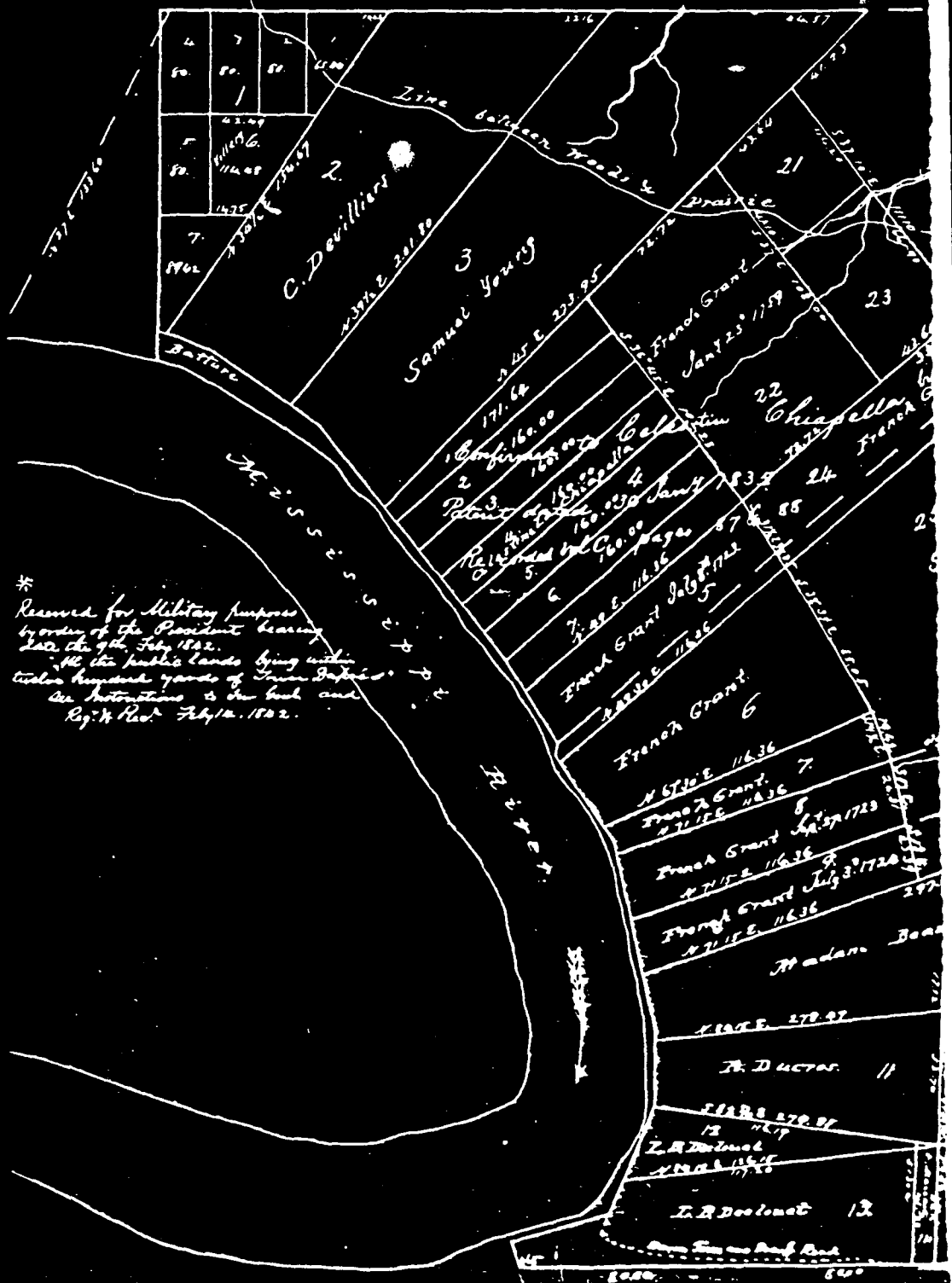
A map from 1723, entitled *Carte particuliere du Fleuve St. Louis, Nouvelle Orleans* shows the concessions located near New Orleans. At this point the lands within the project area lay unoccupied.

However, later that year, on September 27, 1723, the French crown granted a parcel of land to Francois Gallary, also known as Chamilly. This parcel of land is designated as No. 8 on Township 13 Range 13E map from 1831 (Figure 15). On July 3, 1724, Jean Baptiste Leonard received land just below that of Chamilly, designated as No. 9 on the same map. These two land grants make up part of what would become Philippon Plantation, the uppermost of the three plantations established within the study area (*House Reports*, 23 Cong., 1 Sess., Doc. 73, Claim no. 7). Although the lands of the other two plantations, developed by the Beauregard and Ducros families, were probably settled at this time as well, it is impossible to determine precisely who the landowners were.

The planters of Louisiana soon developed indigo as the cash crop for the colony, and it seems that Chamilly and Leonard grew the plant. The cultivation of indigo, however, demands much work and the French colonists turned to the enslavement of

T. XIII R. XIII E.

Rep. with Cert. of 6 March 1832 & Act. 30



*
Reserved for Military purposes
by order of the President bearing
date the 9th Feb. 1802.
All the public lands lying within
twelve hundred yards of Town Square
see Instructions to the land and
Rep. & Act. Feb. 10. 1802.

FIG. 15: Township 1

R. XIII E.

South Eastern District Louisiana

Recd. with letter of 6 March 1832. & Recd. 30 March 1832.

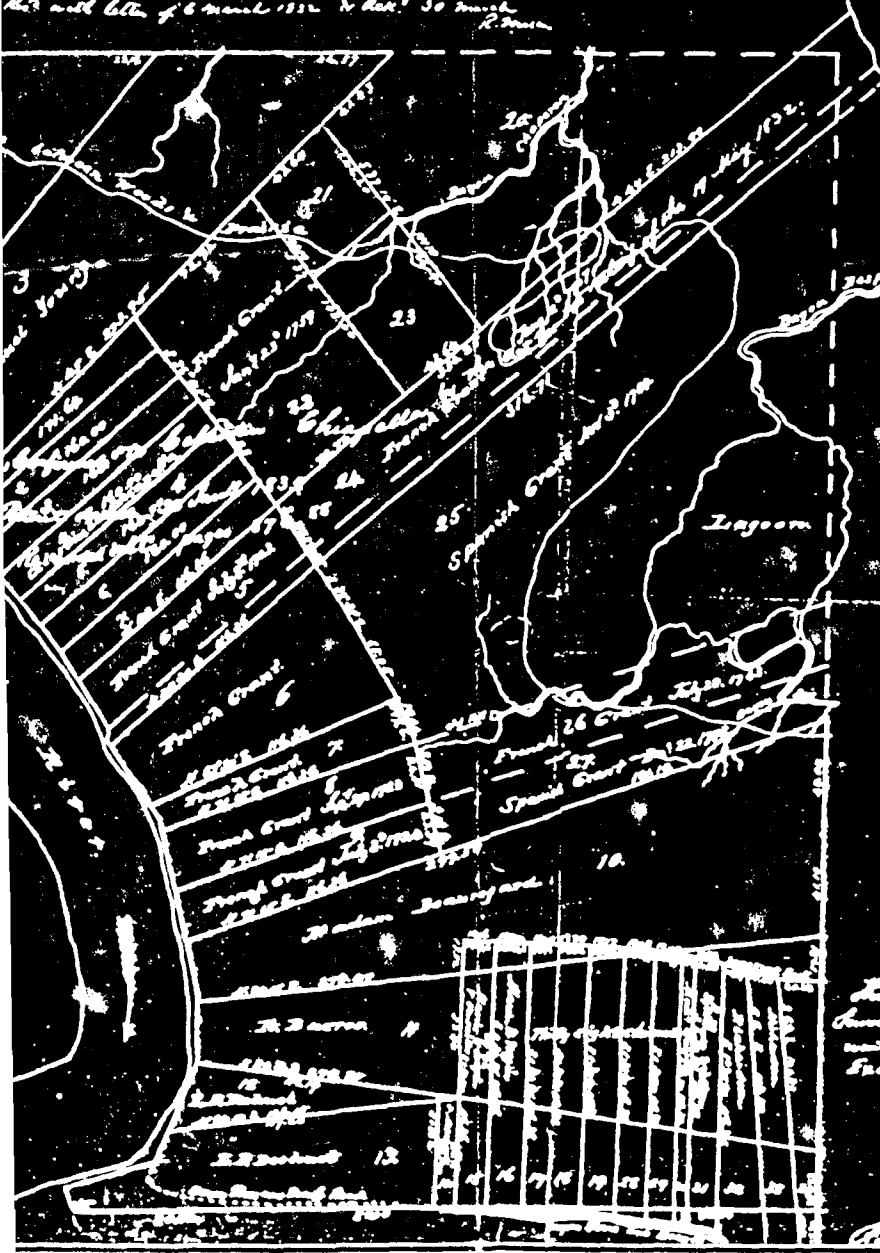


Table of Contents

Claimant's Name	Acres
Travis	1
C. Hamilton	2
J. Jones	3
C. Hamilton	4
Chapman & Hamilton	5
Chapman & Hamilton	6
Hamilton & Hamilton	7
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Hamilton & Hamilton	100

The value of the lands was ascertained by
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 value of 1833 &
 Principal &
 (Signed) A.
 Surveyor Office
 Feb.
 1832

blacks and Indians to satisfy their labor needs. In a census of 1726 it is noted that Chamilly had 3 black slaves and 1 Indian slave. Leonard, however, owned no slaves (Maduell 1972: 55). Later that year, on October 26, 1726, Leonard's name appears on a "list of persons requesting negroes from the Company" (Maduell 1972: 77). By July 1727, Leonard had received his "negroes." A census taken that month shows that 2 black slaves had joined Leonard and his 2 sons on the farm. Chamilly's plantation now contained 4 black slaves and 2 Indian slaves (Maduell 1972: 99). A "list of landowners located along the Mississippi from its mouth" made after 1731, shows that both Chamilly and Leonard still retained their farms. The farm above them was owned by a man named Bachemin (Maduell 1972: 142-143). The lower part of Bachemin's land would eventually become part of the Philippon Plantation as well (*House Reports*, 23 Cong., 1 Sess., Doc. 73, Claim no. 7).

France transferred Louisiana to Spain in 1762. On July 28, 1763, Senor Marquis put in a claim to a parcel of land, behind Chamilly's tract, no. 26 on Map 2. It seems that at some point, Marquis also obtained Chamilly's land. (*House Reports*, 23 Cong., 1 Sess., Doc. 73, Claim no. 7).

A census taken in September 1763 shows that Bachemin, Marquis, and the Widow Leonard owned adjoining properties below New Orleans. The amount of livestock and slaves listed for each farm suggests that, along with indigo, the settlers were now producing meat to be sold in the market at New Orleans. Bachemin owned 4 male slaves, 4 female slaves, and 3 girls. He also owned 8 "bulls or oxen," 25 cows, and 40 sheep. Marquis had 14 male slaves, 4 females, 3 boys, and 4 girls. He had 11 "bulls or oxen," 22 cows, and 40 sheep on his ranch (Voorhies 1973: 44-45).

Widow Leonard was not faring as well as her two upstream neighbors. Along with her 2 boys, she only owned 1 male slave and 1 female. She also owned 6 "bulls or oxen," and 9 cows (Voorhies, 1973: 44-45). On March 23, 1765, it seems that she sold her land to Jacob Corbin Bachemin (*House Reports*, 23 Cong., 1 Sess., Claim no. 7).

It is around this time that the origins of the lower two plantations within the study area come into view. In 1762, by grant from the French government, Chevalier LeSassier obtained 16 riverfront arpents (American State Papers, Vol. 3, Claim nos. 483-484). This grant would eventually be divided and owned by the Beauregard and Ducros families, respectively.

A "list of farms on both sides of the river" below New Orleans taken in January 1770, shows that LeSassier's wife, Jenevieve, occupied a farm with her 4 sons and 6 daughters. Also on the farm were 32 slaves, 12 cattle, and 2 horses. The large number of slaves, coupled with few livestock, seems to indicate that indigo was the main crop raised on the farm. Totals for this census show that indigo was by far the major crop of the farms located below New Orleans (Voorhies 1973: 221, 250).

Neither Bachemin nor Marquis are mentioned in the census of 1770 and their farms might have been unoccupied. On December 22, 1773, Don Henrique Despres obtained tract no. 27 on Map 2, in the rear of the future Philippon Plantation. He also procured the other three tracts that would eventually become the Philippon Plantation (*House Reports*, 23 Cong., 1 Sess., Claim no. 7).

On April 3, 1783, Guillaume Marre obtained the LeSassier grant. Two years later, on March 16, 1785, he sold the plantation to Michel Louis Toutant Beauregard (Oliver Succession 1785) Michel was the son of Jacques Toutant Beauregard, a wealthy landowner and entrepenuer, who held the positions of *perpetual regidor* (permanent councilman) and *alcalde* (judge) under the Spanish regime (Toutant Beauregard Family Genealogy, Louisiana Collection, Howard-Tilton Library, Tulane University).

On April 3, 1784, Michel married Victoire Marie Ducros, thus intitiating the confusing relationship between the Beauregard and Ducros families. Victoire was the daughter of another important Louisianian, Joseph Marius Ducros. Like Victoire's father-in-law, Sieur Ducros held the title of *perpetual regidor*. He also owned a plantation six miles above the Vieux Carre, where Audubon Park is now located (Ducros 1976).

Michel died in 1793, and the process began which resulted in the division of his plantation between the Beauregard and Ducros heirs. Michel's mother, Madeleine Cartier, widow of Jacques Toutant Beauregard, inherited the entire farm from her son (NONA, November 21, 1793, Pedro Pedesclaux). Upon Madeleine's death in 1800, her daughter-in-law, Victoire Marie, received the property (NONA, December 10, 1800, Pedro Pedesclaux). Two years later, Victoire Marie sold half of the plantation to her brother, Rodolphe Joseph Ducros (NONA, February 1, 1802, Stephen de Quiriones).

By this time, Louisiana planters had switched from indigo to sugar cultivation. It seems that Rodolphe and Victoire had begun to grow sugar as well, and for the next eight years the plantation remained intact. In 1810, however, the farm, now measuring 18 riverfront arpents, was divided between Rodolphe and Victoire. The upper 9 arpents, which contained outbuildings and the "maison principale," was assigned to Victoire, and became known as the Beauregard Plantation. At a later date, it was also known as the Banks Plantation. The lower 9 arpents fell to Rodolphe and became the Ducros Plantation, also known as Reunion (NONA, July 19, 1810, Narcisse Broutin).

In 1809, the year before the partition between Rodolphe and Victoire, the 21 arpent plantation located above them was acquired by Francois Philippon. It had been sold by the widow of Don Henrique Despres to Jean Baptiste Riviere in 1799 (NONA, August 16, 1799, Pedro Pedesclaux). Riviere is probably responsible for transforming the property from an indigo farm to a sugar plantation. Ten years later, Riviere's widow sold the plantation to Francois Philippon of New York (NONA, August 15, 1809, Narcisse Broutin). When Francois sold half of the property to his brother Antoine in

1814, it was called a "sugar plantation," and contained 67 slaves (NONA, July 17, 1814, Marc Lafitte).

It seems that the Philippon and Beauregard plantations were also engaged in the cypress lumber business. A great demand for Louisiana lumber had begun in the 1790's when the colony was granted a monopoly by Spain for the making of sugar boxes. Needing water to power sawmills, as well as to provide an easy method of transporting the trees, planters dug canals from the swamp to their mills (Mancil 1972: 71-72).

A.L. Latour's 1815 *Map Shewing (sic) the Landing of the British Army*, indicates that both the Philippon and Beauregard plantations contained sawmill canals. The Philippon Canal, which was dug from Bayou Dupre, was mistakenly shown on the Latour map as being the lower boundary of the Philippon Plantation. In reality, it was located upstream from the lower boundary. The canal located on the Beauregard Plantation is shown both on Latour's map and on a plan attached to the act of sale in 1851 (NONA, February 24, 1851, A. Boudousquie).

Battle of New Orleans:

On December 14, 1814, British naval forces defeated an American force on Lake Borgne and the way was opened for the British to land their troops for the march on New Orleans. The British advanced toward the Mississippi River by way of Bayou Bienvenu and the Villere Canal, upstream from the study area.

The British established their headquarters at the Villere Plantation. A post of black troops was set up downstream at Philippon's Plantation (Latour 1816: 125). It was here that black slaves from the surrounding plantations might have taken refuge. Latour lists 199 slaves taken by the British "whom they refused to surrender, under the pretext of considering them as deserters." The Ducros Plantation claimed 9 slaves lost to the British, Beauregard claimed 2, and Philippon claimed 5 (Latour 1816: clxxxi).

British reconnoitering parties also scoured the surrounding plantations for food. When the British exhausted the supply of cattle found on the occupied plantations "they had recourse to the cattle of the nearest plantations successively, as far as the end of Terre-aux-Boeufs, and even to Morgan's plantation," on English Turn, well below the study area (Latour 1816: 125-126). Latour estimated that over \$200,000 worth of damage to the plantations had been done by the British. This was in the form of loss of slaves, cattle, horses, buildings, and furniture (Latour 1816: clxxxi). Certainly, the Philippon, Beauregard, and Ducros plantations suffered their share of the losses.

Fortifications:

Latour mentions that a few days before January 25, 1815, General Andrew Jackson had ordered "a redoubt to be built on" Philippon's Canal, as a defensive precaution to the British who were still in the area following their defeat (Latour 1816: 203). In General Jackson's report of March 17, 1815, he says that the battery at Bayou Philippon [Dupre] "which was not finished is also abandoned." Latour's map shows a redoubt at the back of the Philippon Plantation. Township Plat T13S, R13E (Figure 15), shows an "old fort" on the place of intersection of the south line of Section 25 with Bayou Dupre, about 2500 ft beyond the 40-arpent line (Casey 1983: 152).

The threat posed by the British during the Battle of New Orleans demonstrated the need of a more extensive system of forts to defend the water avenues leading to the Crescent City. In 1817, Simon Bernard, a French military engineer surveyed the coastal regions of south Louisiana. Among his many recommendations was that the United States build a tower to protect the mouth of Bayou Dupre at Lake Borgne (Robinson 1977: 25-30).

Plans were made to build Tower Dupre in 1821, but construction did not begin until 1827. The Tower, often erroneously referred to as a "Martello" tower, was completed three years later. The fortification was designed for 24 guns and for 50 men to be stationed there in peacetime, 120 during war. However, a garrison of only three men occupied Tower Dupre for most of the antebellum era. It was not even manned at the outbreak of the Civil War. Rumors of a Federal seizure caused the Confederates to send Company B of the 21st Infantry Regiment to occupy the Tower. The Union troops found the Tower abandoned following their conquest of New Orleans in April 1862. After the war, the Tower was repaired and the floors partially relaid. By 1883, Tower Dupre was considered unserviceable and no more appropriations were forthcoming. It passed into private ownership, and over the years, erosion has caused it to now be totally surrounded by the waters of Lake Borgne (Casey 1983: 337).

Nineteenth Century Development:

For the next two decades following the War of 1812, the three plantations within the project area continued to raise sugar without interruption. In 1833, three of Rodolphe Ducros' sons--Edouard Marie, Joseph Marcel, and Louis Alfred--obtained the Ducros Plantation, which now contained 33 slaves (NONA, January 21, 1833, Adolphe Mazureau). Somehow, by 1842, the firm owned by Louis A. Ducros had acquired the plantation. The records are unclear because fire destroyed many of the documents contained in the St. Bernard Parish courthouse. Louis' firm went bankrupt in 1842 and the plantation, containing slaves, a sugar-house, mill, dwelling house, horses, cattle, carts, and farming utensils was sold to Louis and his brother's wife, Elina Olivier for

\$33,500. Of the 23 adult slaves, there were 17 fieldhands, 2 house servants, 2 hostlers, 1 mechanic, and 1 overseer (NONA, July 19, 1842).

The Beauregard Plantation was in the process of being divided at the same time the Ducros Plantation was experiencing ownership changes. In 1834, Gabriel Toutant Beauregard, son of Victoire Marie, sold an interest of the lower 5 and three quarters arpents of his plantation to James McMaster. Included on this property was a sugar house, dwelling house, overseer's house, negro quarters, stables, and barns. In 1851, McMaster added the upper 4 arpents to his holdings (NONA, February 24, 1851, Adolphe Boudousquie).

By this time, McMaster had also acquired the Philippon Plantation. Francois died in 1843 and left his half of the property to his brother Antoine, who now controlled the entire plantation. Upon Antoine's death in 1847, his heirs sold the plantation to James McMaster for \$140,000. The property contained 12,000 superficial acres, "a great part of which is covered with valuable timber." Corn was planted on 120 arpents, 110 arpents were in ratoon (2nd year) cane, and 135 arpents were in plant cane. Also included was a "two story house dwelling, kitchen, large stables, hospitals, brick houses for negroes, sugar house with a steam engine and mill purgery with brick cisterns, blacksmith's shop, utensils, ploughs, carts, 30 mules, 4 horses, 15 oxen, 3 cows, and 77 slaves." The slaves had a wide variety of jobs; other than field hands there were 2 drivers, 1 engineer, 2 sugar makers, 1 blacksmith, 2 carpenters, 1 stable keeper, 1 cattle driver, 1 cooper, 1 poultry keeper, 1 hospital keeper, 1 cook, 1 washer, and 6 house servants (NONA, June 17, 1847, Theodore Guyol).

Although the records are unclear, it seems that McMaster had bitten off a little bit more than he could chew, for R.A. Stewart is listed in the *Sugar Reports* as owning the Philippon property in 1854-55 (Champomier 1855). This, despite the fact that McMaster had raised a plantation record 781 hogsheds of sugar the prior year. Stewart seems to have controlled the property only until 1859, when Dr. Alexander Thomas Belfield Merritt obtained the Philippon Plantation (Champomier 1859).

As shown by the 1860 census, Merritt was the largest slaveholder in St. Bernard Parish, owning 193 slaves. On his plantation there were 54 slave dwellings. There were also 2 horses, 65 mules, 3 milch cows, 6 oxen, 18 sheep, 15 pigs, as well as 3 "other cattle" on the plantation. Corn and sweet potatoes were raised along with sugar cane (Menn 1964: 342). According to the WPA *Guide* for Louisiana, "six dilapidated brick buildings that were erected as slave quarters on the old Philippon Plantation" were still standing in 1941 (Hansen 1941: 496).

The Ducros Plantation remained in the hands of Louis Ducros and his sister-in-law, Elina Olivier, until 1862. In that year, the two divided their joint property and Louis received another holding in return for Elina retaining Reunion. Only 14 slaves were listed as belonging to the property (NONA, February 20, 1862, Adolphe Boudousquie).

The Civil War virtually ruined the sugar industry of Louisiana. Following the war, Reunion Plantation was the only one within the project area that was able to resume the cultivation of sugar. The yields were never high, and sugar production was discontinued on the plantation in 1873 (Bouchereau 1873). Still, the plantation remained in the hands of Elina Olivier Ducros.

However, both Merritt and McMaster, who still owned the Beauregard Plantation, lost their properties. Merritt went bankrupt and was forced to sell the Philippon Plantation. In 1872, it was acquired in a sheriff's sale by the heirs of the Merle family, the grandchildren of Antoine Philippon (Book of Sheriff's Deeds No. 2, Folios 133-144, St. Bernard Parish). Beginning in 1873, the plantation was leased to various farmers, who raised rice, the newest Louisiana crop, until 1889 (Bouchereau 1889).

In 1876, McMaster was forced by bankruptcy to sell the Beauregard Plantation to Citizen's Bank (Book of Sheriff's Deeds No. 2, Folio 251, St. Bernard Parish). Jean Claverie bought the plantation in 1883 for \$7,000, and it has remained in the Claverie family ever since (COB 16, Folio 197, St. Bernard Parish). Like the Merles, Claverie leased his property to various farmers, who raised rice until 1889 (Bouchereau 1889).

In 1896 Elina Olivier Ducros died and left Reunion Plantation to her daughter, Marie Lucie (COB 19, Folio 20, St. Bernard Parish). Marie Lucie was the widow of Gabriel Toutant Beauregard, Jr., son of the old owner of the Beauregard Plantation. She was also the widow of Benjamin Laurent Millaudon, whose family owned a large plantation downstream from the project area.

Marie Lucie held on to the property until 1911, when she divided it into 10 lots and sold them individually to members of the extended Sartalamacchia family, who still control much of the property. It seems that the Sartalamacchia's were truck farmers who raised crops to be sold in the market at New Orleans (COB 20, Folios 356-366, St. Bernard Parish).

Sylvester Plence Walmsley obtained the Philippon Plantation from the Merle heirs in January 1904 (COB 20, Folio 269, St. Bernard Parish). Five months later he sold the property to Borgenmouth Realty, Co. for \$25,000 (COB, Folio 320, St. Bernard Parish).

Borgenmouth seems to have bought the property for its lumber potential. The cypress lumber industry of Louisiana experienced a boom in the 1890's as a result of "increased demand for lumber, declining Northern lumber resources, improved techniques and equipment for logging and the development of railroad systems (Mancil 1972: 77).

Borgenmouth maintained a cypress mill and was among one of the few companies that utilized railroad logging methods only (Mancil 1972: 195). This method consisted of constructing a series of spur lines in the cypress swamp more or less parallel to each

other from the main road. These spurs were usually 1200 to 1600 ft apart (Mancil 1972: 121). Many of the remnants of these logging spurs can be seen on modern maps of the impact area.

The resumption of cypress lumbering activities was shortlived. Although the peak of production was reached in 1915, "the heyday of cypress lumbering was over" ten years later (Mancil 1972: 77).

Industrial Development:

For the most part, the economic activities within the study area were agricultural. However, the construction of a railroad and a transportation canal, aided the development of St. Bernard Parish and the study area. In 1837 the Mexican Gulf Railroad was chartered in an effort to construct a port for New Orleans on the Gulf of Mexico. A 70-mile long railroad was proposed to be built east from New Orleans to the Isle of Pitre, a deep-water harbor on Lake Borgne. It was hoped that this would save ships the trouble of traveling all the way to the mouth of the Mississippi River. Construction began in the summer of 1839 and by the end of the year, 19 miles had been constructed from New Orleans, all the way to the mouth of Bayou Terre-aux-Boeufs. A station was erected there in 1841 but that was the furthest extent of construction. One historian has stated that the Mexican Gulf Railroad idea "must be written off as a total loss except to a few plantation owners east of the city." Since the railroad passed through the three plantations of the study area, it must be presumed that Philippon, Beaugard, and Ducros benefitted from the Mexican Gulf Railroad (Reed 1966: 41-43).

By the 1850s, though, the railroad was neglected. Charles Bienvenu, a planter in the area, stated that by 1853 it was "not fit to travel on." Captain S.W. Sawyer of the Union Army took charge of the railroad in October 1862 and declared that only "one engine [was] in running order, and that in a very bad condition." In addition, the cars and roads were also in a poor state, "it being almost impossible to run the cars." By 1866, it had "constantly been getting worse, and [was] almost impossible to make a trip" on the line (Report of the Special Committee on the Mexican Gulf Railroad, 1866, Louisiana Collection, Howard-Tilton Library, Tulane University Library).

The Southeastern Railroad Company acquired the rights to the Mexican Gulf Railroad and in 1882 transferred them to the Mississippi, Terre-aux-Boeuf, and Lake Railroad Company. In 1886, the MT&L rebuilt the line from the town of Poydras west to the depot in New Orleans located on Elysian Fields. The following year, the New Orleans and Gulf Railroad Company was incorporated and completed the laying of tracks from Poydras to Bohemia. In 1891, the New Orleans and Southern Railway Company was organized and acquired all the rights to the line. During the depression of 1896 the railroad was sold to the Louisiana Southern Railway Company who has controlled it ever since (Meyer 1975).

In 1886 the Violet Canal was constructed along the old Philippon Canal and Bayou Dupre. Its purpose followed the same idea as that of the Mexican Gulf Railroad--to connect the Mississippi River with Lake Borgne. The St. Louis, New Orleans, and Ocean Canal and Transportation Company built a lock measuring 20 feet wide, which was funded by a grant from the State of Louisiana. Because of shoaling, the lock was abandoned some time before 1900, and the connection with the Mississippi River blocked.

In 1900, the Lake Borgne Canal Company took over the property, enlarged the canal and, in 1904, built the present lock (Iroquois Research Institute, 1982: 107). A 1905 publication mentions several industries that had grown up along the Lake Borgne Canal. The Southern Transportation Company operated a line of lumber barges through the Canal. The Louisiana Lime Company owned a factory from the tracks of the Louisiana Southern Railroad, which extended along the banks of the upper side of the Canal. Plans were being made to establish a brick factory, a canning factory, and a system of coal docks (Southern Manufacturer *Sketchbook*, 1905: 23, 27). However, activity on the Lake Borgne Canal declined in 1923 with the completion of the Inner Harbor Navigation Canal (Hansen 1941: 487). In 1947 the Canal became wholly inoperative (Iroquois Research Institute 1982: 108).

Since then, most of the economic activity within the project area has consisted of truck farming and fishing.

CHAPTER SIX:

PREVIOUS INVESTIGATIONS

by

Kenneth Jones

A number of archeological investigations have been conducted within or near the present study area. One prehistoric site (Horseshoe Bayou, 16SB100) has been reported within the project area. Other prehistoric sites (Shell Beach Bayou, 16SB39; Dupre, 16SB40; Lake Borgne - Bayou Dupre, 16SB71; and Newfield, 16SB132) are located near the study area. All of these nearby sites are on or near the present shore of Lake Borgne.

One historic site (Lake Borgne Canal Redoubt, 16SB89) has been reported within the project area. Another historic site (Reunion Plantation, 16SB101) may lie partially within the study area; the reported location of this site is too vague to precisely fix its position. A field visit to the site will be required to determine if the presently defined project area boundaries will pass through it.

Other historic sites are located in proximity to the study area. Two of these sites (Lake Borgne - Bayou Dupre, 16SB71; and Martello Castle, 16SB85) are nineteenth century military sites on Lake Borgne. The other nearby historic sites (Merits Plantation, 16SB102; unnamed brick piers, 16SB104; Lake Borgne Canal Lock, 16SB105; unnamed pumphouse foundation, 16SB106; Poydras Plantation mill remains, 16SB122; and Guichard Plantation mill remains, 16SB123) are located on the east (left descending) bank of the Mississippi River, between river miles 82 and 85. This stretch of riverbank lies immediately north of the head of Bayou Terre aux Boeufs. The broad natural levee along this part of the Mississippi forms the western limit of the Bayou Dupre watershed. Archeological sites on the west (right descending) bank of the Mississippi River or on the Bayou Terre aux Boeufs distributary will not be dealt with in this report.

Archeological research in St. Bernard Parish began with the seminal investigations of Fred B. Kniffen in the 1930s. Kniffen used his geological training to interpret the processes of subsidence and shoreline erosion affecting site destruction and the

correlation of prehistoric site locations with the natural levees of active or relict stream courses (Kniffen 1936:410). He also identified the Bayou Cutler and Bayou Petre ceramic assemblages. Kniffen worked primarily in the eastern part of St. Bernard Parish, and none of the sites investigated by him are in or near the present study area. The first prehistoric sites recorded near the project area were Shell Beach Bayou (16SB39) and Dupre (16 SB 40), reported in 1952.

Systematic archeological research in the parish resumed with the work of William G. McIntire in the 1950s. He was especially interested in the dating of Mississippi delta lobes and utilized prehistoric site locations as one form of evidence, noting the correlation of particular active distributaries with certain periods and phases in prehistoric ceramics. McIntire performed the majority of his research in eastern St. Bernard Parish, but he did identify a Bayou Petre component at the Dupre site (McIntire 1958:128). Philip Phillips, utilizing McIntire's sherd counts, subsequently identified Dupre as a Magnolia Phase site. This designation is not accepted by all later researchers, as the sherds in question may pertain to the earlier Labranche phase (Wiseman et al. 1979:4-12).

A series of important coastal archeological investigations began in the 1970s, fueled by the passage of cultural resources management laws and a growing awareness of the loss of coastal wetlands. Several of these studies dealt with archeological sites in the vicinity of the MRGO. Of particular importance is the overall survey of cultural resources along this waterway conducted by Coastal Environments, Inc. in the late 1970s (Wiseman et al. 1979). This survey reviewed all the prehistoric sites recorded through the 1970s in or near the present study area, and provides the most detailed analysis of prehistoric site dating and distribution in St. Bernard Parish.

Summary tables of site information indicate that Shell Beach Bayou (16SB39) dates to the Marksville period, phase undetermined. Dupre (16SB40) exhibits components from the Marksville period, phase undetermined; the Baytown period, Whitehall phase; the Coles Creek period, Bayou Cutler phase; and the Mississippi period, Bayou Petre phase. Lake Borgne - Bayou Dupre (16SB71) has yielded components from the Coles Creek period, Bayou Cutler phase; the Mississippi period, Bayou Petre phase; and historic material associated with the nineteenth century occupation of Tower Dupre, popularly known as Martello Castle. No period or phase is assignable to Horseshoe Bayou (16SB100), a dredged shell midden first reported by C.E.I. personnel (Wiseman et al. 1979: Tables 4-3, 5-2).

A significant aspect of C.E.I.'s interpretation of the local prehistoric sites is the attempt to link their initial occupation with the decline of the local Mississippi River distributaries. Material possibly dating to the Poverty Point period (1500-500 B.C.) has been reported from St. Bernard Parish; the relict Proctor Point distributary is a possible venue for pre-ceramic sites dating as early as that period (Wiseman et al. 1979:6-9, 8-5). The possibility of recovering material from that early date within the study area depends

on the depth of dredging along canals. Stratigraphic profiles along the MRGO indicate that nowhere along that waterway is sediment from delta lobe five, that associated with the Poverty Point period, found at a depth of less than 10 feet.

The suggested developmental cycle of the Proctor Point distributary places it in an active growth phase through the Poverty Point, Tchula and Marksville periods (1500 B.C.-A.D. 400) and in a condition of abandonment during the subsequent Baytown, Coles Creek and Mississippi periods (A.D. 400-1700). The distributary system would therefore have reached full maturity, and subsequently begun its decline, during the Marksville period. One subsurface distributary which crosses MRGO between Bayou Dupre and the eastern end of Shell Beach Bayou was active during delta lobe 9, 2500-1800 B.P., and subsequently abandoned and buried (Frazier 1967:figs. 10, 12).

The Dupre and Shell Beach Bayou sites were first occupied during the Magnolia phase of the late Marksville period, A.D. 200-400. Although extensive areas of midden survive at Shell Beach Bayou, few artifacts have been collected there. The Dupre site (16SB40) may be merely an extension of the midden group composing 16SB39 (Wiseman et al. 1979:5-19 to 5-25, 6-17).

The shell midden reported as Horseshoe Bayou (16SB100) consists of a lens of midden within spoil deposit, the material dredged from the canal bounding the existing spoil deposit area parallel to the south bank of MRGO. The only artifacts recovered from this midden were sherds of Baytown Plain, variety unspecified, and therefore of indeterminate age. Well-preserved pollen samples were recovered from the midden and include levee-inhabiting species such as oak and sweetgum (Wiseman et al. 1979:5-35 to 5-38). The original recorders of the site suggested that efforts should be made to locate the *in situ* midden, but did not consider the site eligible for the National Register. A 1982 update in the state site files reported that a camp had been constructed over the displaced midden material, which was no longer visible.

In 1983 an extensive area of wave-washed shell midden was reported east of Shell Beach Bayou on the south shore of Lake Borgne. Designated the Newfield site (16SB132), this represents the next-nearest confirmed prehistoric site to those clustered about Bayou Dupre. Grog-tempered pottery was collected here; no date has been assigned to the site.

In addition to prehistoric site investigations, considerable attention has been given to the nineteenth century fortifications along Lake Borgne. These were components of a network of military strongpoints guarding all possible maritime approaches to New Orleans. The federal government erected this defensive system to prevent a repetition of Louisiana's experience in the New Orleans campaign of 1814-1815, when British forces reached the Mississippi River via a minor waterway feeding into Lake Borgne. The forts on the southern shore of Lake Borgne, constructed between the 1820s and the Civil War, were never involved in any military engagements. The cultural material and

construction techniques at Battery Bienvenue (16SB84), Martello Castle (16SB85) and Fort Proctor (16SB83) can be usefully compared, although each of these military posts has distinctive construction history and features (Wiseman et al. 1979:3-16, 5-14 to 5-19, 5-28 to 5-31).

Martello Castle (Tower Dupre) was constructed in 1829-1830 on the east (right descending) bank of Bayou Dupre, near the south shore of Lake Borgne. The central structure of the military post was a hexagonal masonry tower housing a magazine and battery, as well as the barracks for the garrison. This structure is not a true martello tower, although influenced by the design of that circular class of fortifications. The stronghold has been popularly referred to as a martello castle or tower since its construction, as evidenced by the 1829-1831 plat of T13S, R13E on which it is named "Martello Castle" (Fig. 15). On the lakeward side of the masonry tower was an exterior battery protected by an earth parapet.

The progressive erosion of the lakeshore is amply documented by the loss of land around the fort. By 1870 storm-generated erosion was adversely affecting the parapet of the exterior battery. Photographs taken in 1915 show the tower standing within Lake Borgne, close to the lakeshore (Greene 1982:280; illus. 104, 105). At present Tower Dupre is located approximately 100 meters north of the lakeshore; its continued survival is due to its stabilization for use as the core structure of a camp.

A similar record of shoreline erosion is demonstrated by Fort Proctor. Construction of that fortification began in 1856 and ceased in 1860; the work, halted by the Civil War, was never resumed. The square masonry tower at Fort Proctor was built near the shore of Lake Borgne; now the structure stands within the lake (Wiseman et al. 1979:5-28 to 5-31). Fort Proctor (16SB83) is on the National Register of Historic Places.

The marshland forming the landscape of the project area is not uniform, and erosional processes are advancing much more rapidly in some localities. In a study of erosion along the bankline of the Mississippi River Gulf Outlet the landforms were identified as soft marsh, firm marsh, and swamp substrate. The projected intersection of the Violet Alternative with MRGO lies in an area designated as soft swamp. The area around the mouth of Bayou Dupre likewise consists of soft swamp (Howard et al. 1984: Fig. 28a). Sites in this area are subject to swifter erosion than those found in firm marsh areas, such as Shell Beach Bayou.

The section of soft swamp north of the project area forms one of three severely erosion-threatened areas along the north bank of MRGO. This sector, Critical Reach 1, includes the mouth of Bayou Dupre and the Shell Beach Bayou area. If no protective measures are taken in this area the remaining terrain here separating Lake Borgne from MRGO will disappear completely by 2040.

The marshlands constituting roughly the northern half of the project area and the adjacent lakeshore are areas of very high subsidence potential (Burk & Associates, Inc. n.d.: map 16). Exposed archeological sites will be subjected to progressive degradation as more of the landscape is inundated. Estimates of local subsidence rates vary between 0.4 and 1.3 ft per century (Howard et al. 1984: 2-11). The rate of eustatic sea level rise during the recent past has been estimated at 0.5 feet per century (Nummendal 1983). These factors, and the predicted acceleration in rise of eustatic sea levels, should draw urgent attention to the imperiled cultural resources of the coastal marshlands.

Evidence derived from maps and air photos covering the period 1931-1983 shows the highest rate of land loss along Lake Borgne and along the banks of MRGO, but also shows substantial loss of land along Bayou Dupre and the Lake Borgne Canal. Additional loss of land has occurred along portions of Bashman Bayou adjacent to the north-south pipeline canal traversing the study area. Many minor tributaries along the lower course of Bayou Dupre have broadened to lacustrine proportions (May and Britsch 1987).

On the lakeshore adjacent to Tower Dupre is site 16SB71, a wave-washed *Rangia* and oyster shell midden containing both prehistoric and historic components. Historic material collected here includes brick and slate rubble and an assemblage of ceramics and glass dating from the mid nineteenth century to early twentieth century. Comparable ceramic and glass assemblages have been recovered at wave-washed site 16SB40 to the east, and are probably related to the occupation of 16SB71. The presence of material postdating the 1870s indicates the reuse of the Tower Dupre area for nonmilitary activities, probably as a hunting or fishing camp (Wiseman et al. 1979: 5-15 to 5-20, 5-23 to 5-25).

Undocumented camps probably were located at or near the mouths of many of the navigable bayous feeding into Lake Borgne. An unconfirmed historic site lies along the lower course of Bayou Mercier, about 3 kilometers northwest of Tower Dupre (Wicker et al. 1982: 76). As erosion and subsidence have destroyed sites on the historic coastline, the location of hunting and fishing camps may exhibit a general movement inland through time. The development of camps along Horseshoe Bayou and other localities south of MRGO in this region is a modern phenomenon; historic remains reflecting such a marsh camp pattern have not been reported here.

Other surveys have been conducted in or near the study area over the years (i.e., Floyd 1981), but by far the most important archeological investigation undertaken near the study area's river access corridor was conducted by personnel of Iroquois Research Institute in 1981. One of the survey areas they covered was the Poydras Revetment, which entailed a pedestrian survey and testing regime of the batture between river miles 81.8 and 85.6 along the east (left descending) bank of the Mississippi (Iroquois Research

Institute 1982: 3, 15-17). This revetment area encompasses the sector of bankline adjacent to the Bayou Dupre drainage basin.

Three historic sites were recorded by I.R.I. personnel in the Poydras Revetment, none of them within the present study area. Site 16SB104, located downriver from Frances Place in the river frontage of Section 4, consists of *in situ* brick piers and associated structural debris. No other cultural material was recovered at the site; the unidentified structure probably was built prior to the construction of the modern levee, but no more precise dating was suggested. Site 16SB106 is located on the northern edge of the Poydras Crevasse, in the river frontage of Section 13. The site consists of a concrete slab foundation for a water pump. A local informant reported that it was constructed in 1936. Neither of these sites were evaluated as significant, and no further investigations of these structural remains were recommended.

The Lake Borgne Canal Lock (16SB105) is of interest for its relation to navigation on Bayou Dupre. The site consists of the masonry structures forming the ends of the lock, and the rear lockgates and associated hardware. The lockgates are detached from their original positions, and lie between the masonry piers; the front lockgates have disappeared. The structures are overgrown and the lock is partially filled with earth. The lock was constructed at the turn of the century and became inoperative by 1947 (Iroquois Research Institute 1982: 97-98, 107-108, 115). The Lake Borgne Canal Lock, also known as the Violet Lock, was permanently closed in 1950 (U.S. Army Corps of Engineers 1981: 100-101).

Iroquois did not recommend this site for nomination to the National Register of Historic Places, but suggested that the structure was of significance for local history. The site lacks integrity and broader regional significance, and cannot be regarded as unique. Recent review of the site has evaluated it as non-significant (Carol Kleinhans, personal communication 1989). An earlier canal lock, built in 1886 and abandoned before 1900 due to shoaling, has not been reported archeologically. That structure may have been destroyed when the larger lock was constructed (Iroquois Research Institute 1982: 107).

Two historic sites are closely related to agricultural development of the project area's river corridor: Reunion Plantation (16SB101) just south of the study area, and Merits (sic) Plantation (16SB102) near the upriver end of the area. These sites have not been tested archeologically and their present condition is incompletely documented. The 1980 site report on 16SB102 indicates massive disturbance at that site, or the portion of the plantation located between the modern levee and the old St. Bernard Highway (River Road).

Archeological investigations of historic sites in the project area vicinity have not consistently focused on key cultural themes. This reflects the fragmented coverage of the area in fieldwork performed to date, due to the definition of research zones in this

sector. The restriction of survey areas is most clearly seen in the work performed by Iroquois. By limiting investigations to those sites recorded on the present batture, no clear picture emerges of the broader distribution of plantations or of industrial and transportation facilities. The inspection of scattered sites without a wider frame of reference for their analysis is of limited value. The information collected on individual sites is useful, but the sites are not tied into the patterns of local culture.

In contrast, the broad-area coverage of MRGO and vicinity by C.E.I. personnel allowed them to look at multiple examples of coastal fortifications on Lake Borgne, providing valuable comparative data on structural design, artifact assemblages, and site destruction processes. This work addressed questions regarding the development of Louisiana's coastal defense system later articulated in the state archeological plan (Smith et al. 1983: 97, 255). A subsequent overview of cultural resources in a broad wetland zone (the territory between the back protection levee, or hurricane protection levee, and Lake Borgne) emphasized significant cultural features related to military activities, transportation, and commercial lumbering in the region. This focus of attention was easier because the zone studied was never an agricultural district and, apart from a few hunting and fishing camps, contained historic habitation areas only at isolated loci of the above activities (Wicker et al. 1982).

These studies provide admirable thematic coverage of the coastal wetlands, but their analysis is weakened by the exclusion of the riverine portion of the parish. The cypress lumber industry, marshland navigation, and the network of coastal defenses can not be fully understood without treating the activity areas and transportation routes extending from the Mississippi River to Lake Borgne. Commercial timber harvesting in backswamp areas supplied a lumber mill at Borgnemouth (Violet). Navigation patterns in the marshland were tied to the operation of the canal lock at Violet, or to roads and railroads providing access to the Mississippi River and the New Orleans market. The construction of coastal fortifications required staging areas and supply routes which linked these to the river, and these military posts were established explicitly to guard vulnerable points of access to the Mississippi or the natural levees bordering it.

The scope of investigations undertaken in cultural resources management is necessarily limited by contractual specifications; the archeological research conducted in this region to date has suffered through the restriction of analysis to a truncated range of environmental zones. Any scope of work which fails to address the full spectrum of local geographic units and their interrelationships will provide an inadequate interpretive framework for the area's cultural resources. Contemporary reviews of cultural resources management goals stress the need for both a thematic focus and a regional perspective in the preparation and execution of research designs (Eastern New Mexico State University 1988). The examination of a swath of territory extending from riverbank to lakeshore would provide an opportunity to assess the long-term interactions of the diverse geographic units composing St. Bernard Parish.

CHAPTER SEVEN:

RESEARCH DESIGN

by

Kenneth Jones

The purpose of this research design is to provide a realistic and cost-effective strategy for the investigation of archeological resources within the impact area of the proposed Violet alternative. The fieldwork design therefore entails an examination of all ecological subunits of the study area, and a consideration of the constraints imposed on investigative techniques by field conditions in a wetland environment. The objective of the proposed fieldwork is to locate unrecorded archeological materials, utilizing a site prediction model based on the geomorphological setting of known archeological sites within and near the study area. A concurrent search for sites outside the predicted location zones will be conducted as a test of the model. A list of research questions is provided in Figure 16.

Site Prediction Model:

Archeologists working throughout the wetland environments of South Louisiana have found a strong correlation of archeological site location with terrain elevation. Elevated locales include salt domes, beach ridges, and the natural levees of distributary channels. The slight difference in elevation between these features and lower surrounding backswamp or marshland creates a series of ecological niches, thus offering a broader range of natural resources for exploitation. The greater elevation of these locales also provides safer habitation sites, particularly during hurricanes or high river stages on the Mississippi. Full exploitation of the coastal estuarine environment probably required such elevated terrain features, whether utilized as resource procurement areas, food processing stations, or habitation and industrial sites. The stratigraphic depth of many shell middens in the region reflects the repeated use of favorable locales in these environments, as does the historic occupation or utilization of these sites. The predictive model for archeological site location therefore posits high probability areas delineated by greater elevation on natural terrain features, and low probability areas outside these selected locales. The model can be refined further by predicting the preferential

RESEARCH QUESTIONS

- 1) Are archeological sites contemporary with early deltaic cycle stages under-represented in the archeological record, due to abandonment and burial? An examination of the site along Horseshoe Bayou (postulated to follow the earlier stream channel of the relict Proctor Point distributary) may reveal archaeological assemblages associated with the early growth stage of that distributary.
- 2) Is the correlation of archaeological site density with present terrain elevation skewed by the burial of earlier sites, leading to self-fulfilling site density predictions? The examination of elevated terrain features and of bankside spoil from canals traversing lowlying areas will provide a cross-check on the probability of encountering archaeological material from these diverse zones.
- 3) Can outlying structures and field patterns be identified with Reunion Plantation (16SB101) and other particular riverside plantations? The rear limits of historic agricultural remains may be indicators of the ecological constraints on commercial planting of sugar and rice crops in this area.
- 4) Can the Lake Borgne Canal Redoubt (16SB89) be identified? The location reported in the state site files is unconfirmed. Ground-truthing will be necessary to determine the site's position and present condition, if it survives.

FIG.16: List of Research Questions

utilization of a) areas along distributaries feeding into estuarine environments; b) the confluences of waterways; and c) locales near brackish lakes or bays.

This predictive model appears to represent the straightforward "feel" for site location developed by field archeologists in South Louisiana. Actual confirmation of this model has been problematic. Subsurface high probability areas can remain undetected due to lack of surface manifestations. Our interpretations of geomorphological history and former environmental conditions may be inadequate due to incomplete regional coverage or misidentification of landforms. Explanatory subsistence strategies proposed for prehistoric site distribution suffer from the incomplete nature of data recovery and our limited understanding of site function and typology. The explicit or implicit employment of elevation-oriented strategies in much of the regional fieldwork performed to date has skewed the recovery pattern of archeological material, thus generating a self-fulfilling predictive methodology (Stout 1988: 3-4).

Several proposed modifications of the elevated terrain use model likewise face problems in field application. Archeologists at Coastal Environments, Inc., have suggested that occupation of the coastal areas is tied to the developmental cycle of delta formation and abandonment, with highest utilization of a distributary system following the onset of decline. This model provides an over-arching interpretive framework for both regional site distribution and ecological constraints on individual site evaluation. The deltaic cycle model seems to offer a common sense argument for intensified occupation of mature, comparatively stable distributaries, based on broadly understood geomorphological shaping of the coastal environment. It is necessary to caution against an uncritical reliance on this model, however, as sites occupied during the early growth period of a delta may be buried by later deposition. The model therefore must be verified by a site search regime outside the suggested high probability mature delta features as a check on the recovery of earlier occupation areas. Another model for regional site distribution advanced by C.E.I. personnel includes lakeshores and bayshores among high probability site areas. The potential for resource acquisition offered by these locales provides an economic interpretation for their utilization, but the possible misidentification of earlier landforms with modern shoreline features remains a limiting factor in the application of this model (Stout 1988: 3-4). Many current lakeshore or bayshore sites were occupied as distributary channel levees or other elevated terrain features, and have become shoreline sites due to regional processes of erosion and subsidence subsequent to their abandonment. If locales in proximity to brackish water areas were preferentially occupied, as posited above, many of these sites would be exposed to geologically rapid site destruction processes during the senescence of local distributaries. Present shoreline locales therefore must be interpreted on a site by site basis, keyed to local geomorphological history.

The general predictive model for site location, emphasizing the preferential use of elevated terrain features, is generally true for both prehistoric and historic sites. The distribution of unrecorded historic sites is also expected to display a strong correlation

with proximity to transportation arteries: roads, railroads, and navigable waterways. In the present study area such routes can be identified prior to fieldwork through documentary material or by the transformation of the landscape visible on modern maps and photographs, especially infrared air photos.

Archeological Expectations - Prehistoric Remains:

All aboriginal sites identified to date in or near the study area are located on the present shores of Lake Borgne or on bayous leading into the lake (See Figure 17). This site distribution correlates with the presence of a relict distributary channel of the Mississippi River. This distributary is identifiable by modern vegetation patterns and by core samples of the buried levee deposits. The relict channel traversed the study area from southwest to northeast, draining from the Mississippi in the vicinity of Frances Place to Proctor Point. An area of cypress swamp formerly extended some 2 km of the Forty Arpent Canal in Section 24 and the western portion of Sections 25-26-27 of T13S, R13E (Burk & Associates n.d.: map 2; Wicker et al. 1982: Figures 2-28, 2-29). This cypress forest occupied higher ground near the head of the former distributary. A narrow, unnamed bayou now runs from the center of this cypress swamp in Section 24 northeast to its confluence with Horseshoe Bayou. Site 16SB100, the sole prehistoric site recorded within the study area, is located on Horseshoe Bayou near this confluence. Horseshoe Bayou is a section of the former channel of Bayou Dupre, as shown in nineteenth century maps including the USGS 15 min. St. Bernard sheet, 1892 edition. During the dredging of the Lake Borgne Canal at the turn of the century the navigation channel was shortened by cutting across a bend in the course of Bayou Dupre; the resulting cutoff channel has been known since as Horseshoe Bayou.

The relict distributary channel may have followed roughly the present course of the northern half of Horseshoe Bayou and continued across the Mississippi River Gulf Outlet toward Shell Beach Bayou. The subsurface levee deposits of a minor distributary channel associated with Delta Lobe 9 were encountered in cores taken along the MRGO east of the mouth of Bayou Dupre (Wiseman et al. 1979: Figures 6-3; Howard et al. 1984: Figure 3a). Several prehistoric sites between the MRGO and Lake Borgne lie on or near this relict channel. Site 16SB71 is at the mouth of Bayou Dupre, 16SB39 is at a channel confluence along Shell Beach Bayou, and 16SB40 is just to the north at the mouth of Shell Beach Bayou, on the south shore of Lake Borgne. Site 16SB132, on the shore of Lake Borgne approximately 5 km. east of 16SB40, may likewise be associated with the distributary which formed Proctor Point. An unconfirmed prehistoric site has been reported east of 16SB39 along Shell Beach Bayou, and additional areas of wave-washed shell midden have been reported farther east along the lakeshore, near the northern terminus of the Proctor Point peninsula (Wicker et al. 1982:76). Although no sites have been identified with the early phases of the postulated Proctor Point distributary, buried cultural material recovered by dredging at 16SB100 may be associated with that channel. The present courses of Horseshoe Bayou (Bayou Dupre

Plaquemine Period Sites

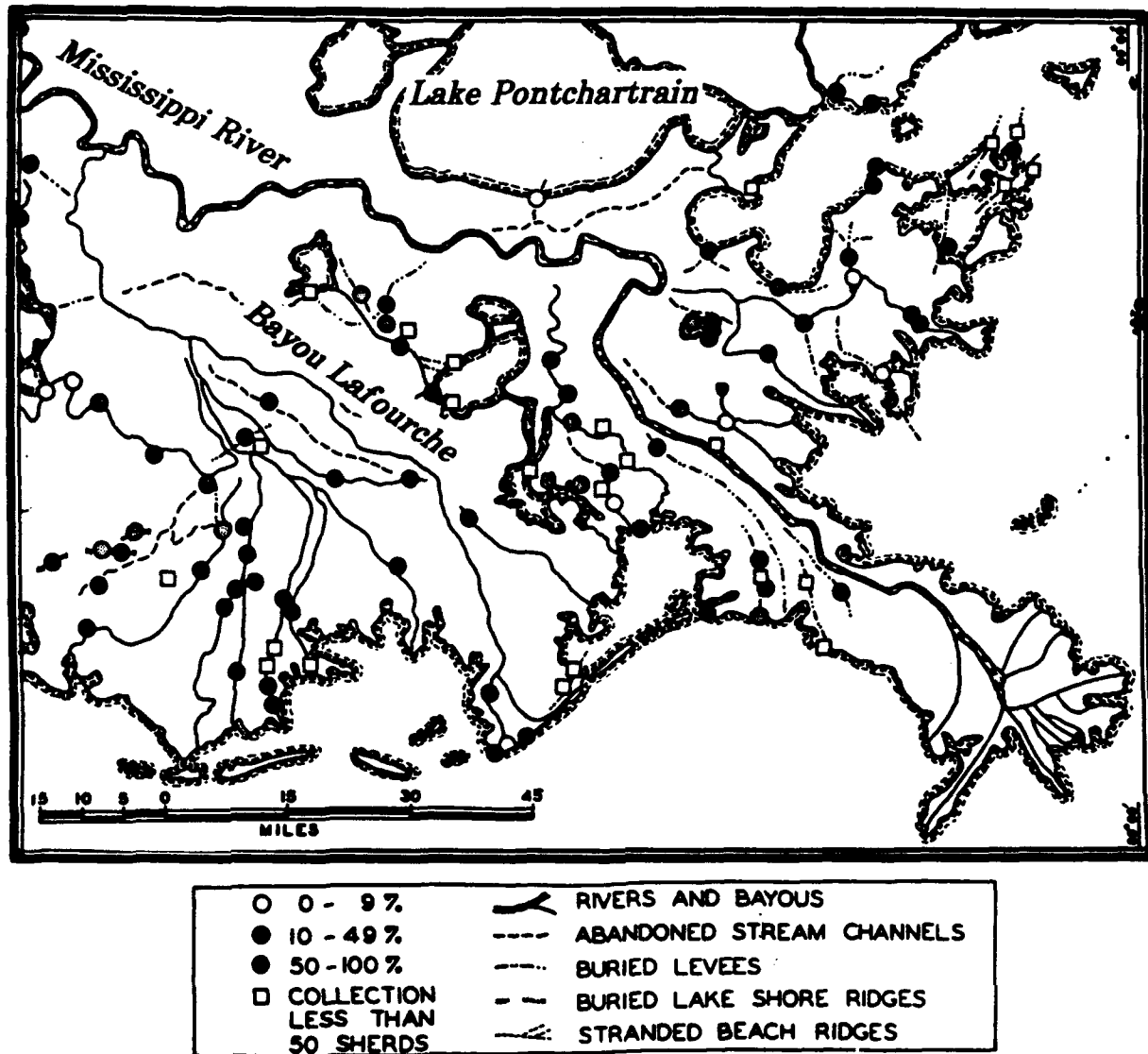


FIGURE 17: Correlation of aboriginal sites with Bayou LaFourche, a relict distributary channel of the Mississippi River (from McIntire 1958).

cutoff) and Shell Beach Bayou perhaps represent continued occupation of sections of the early distributary by later stream systems; this possibility should be tested by subsurface sampling, although Shell Beach Bayou lies outside the project study area.

The wave-washed shoreline material recovered at sites 16SB71, 16SB40 and 16SB132 may represent prehistoric sites located along the natural levees of channels leading to Lake Borgne from the tentatively identified Proctor Point distributary. Site 16SB39 is located at the confluence of an east-west channel, largely occupied by the modern course of Shell Beach Bayou, and a channel leading north into Lake Borgne and forming the present mouth of the bayou. The site consists of six discrete midden areas clustered about this confluence; its subsurface extent may be substantially greater. This locale offered ready access to lacustrine resources and to the Mississippi River through the early distributary course traversing the study area, or through Bayou Dupre at a later period. Site 16SB40 is less than 1 km from 16SB39, and the two may form subareas of a single site complex. The well-documented erosion of Lake Borgne's shoreline suggests that the cultural material defining 16SB40 is being progressively redeposited along a receding lakeshore.

The high probability areas for prehistoric site occurrence in this sector of St. Bernard Parish can be identified as the river bankline and high natural levee deposits of the Mississippi River, in the segment of the study area between the river channel and the back protection levee, and the higher terrain features along modern or relict channels between the back protection levee and the Mississippi River Gulf Outlet. The present courses of Bayou Dupre/Horseshoe Bayou, Bashman Bayou, and their principal tributaries are well defined; the postulated alignment of the relict Proctor Point distributary is an approximation (See Figure 18).

The Mississippi riverside area would offer access to riverine resources and to the ecological zones of the broad natural levee. Local or long distance transportation would have been facilitated by the river. This locale could have sustained a substantial population, particularly with an agricultural subsistence base. The course of Bayou Dupre represents a localized backswamp drainage area, and probably not a significant river-to-lake route prior to the dredging of the historic canal along its upper length. Canoes may have passed from the Mississippi River to Lake Borgne via a portage to the headwaters of the bayou in the river corridor of the present study area. This limited access suggests that lacustrine resources would not have contributed importantly to subsistence patterns for inhabitants in this riverine area.

No prehistoric remains have been recovered in this river corridor area to date. The head of the Bayou Terre aux Boeufs distributary is only about two kilometers south of the study area's river corridor, on the east bank of the Mississippi. That locale probably offered not only higher terrain for habitation, but easier access to coastal resources via a variety of waterways. A significant prehistoric settlement in the river corridor delimited by this project's study area therefore appears unlikely.

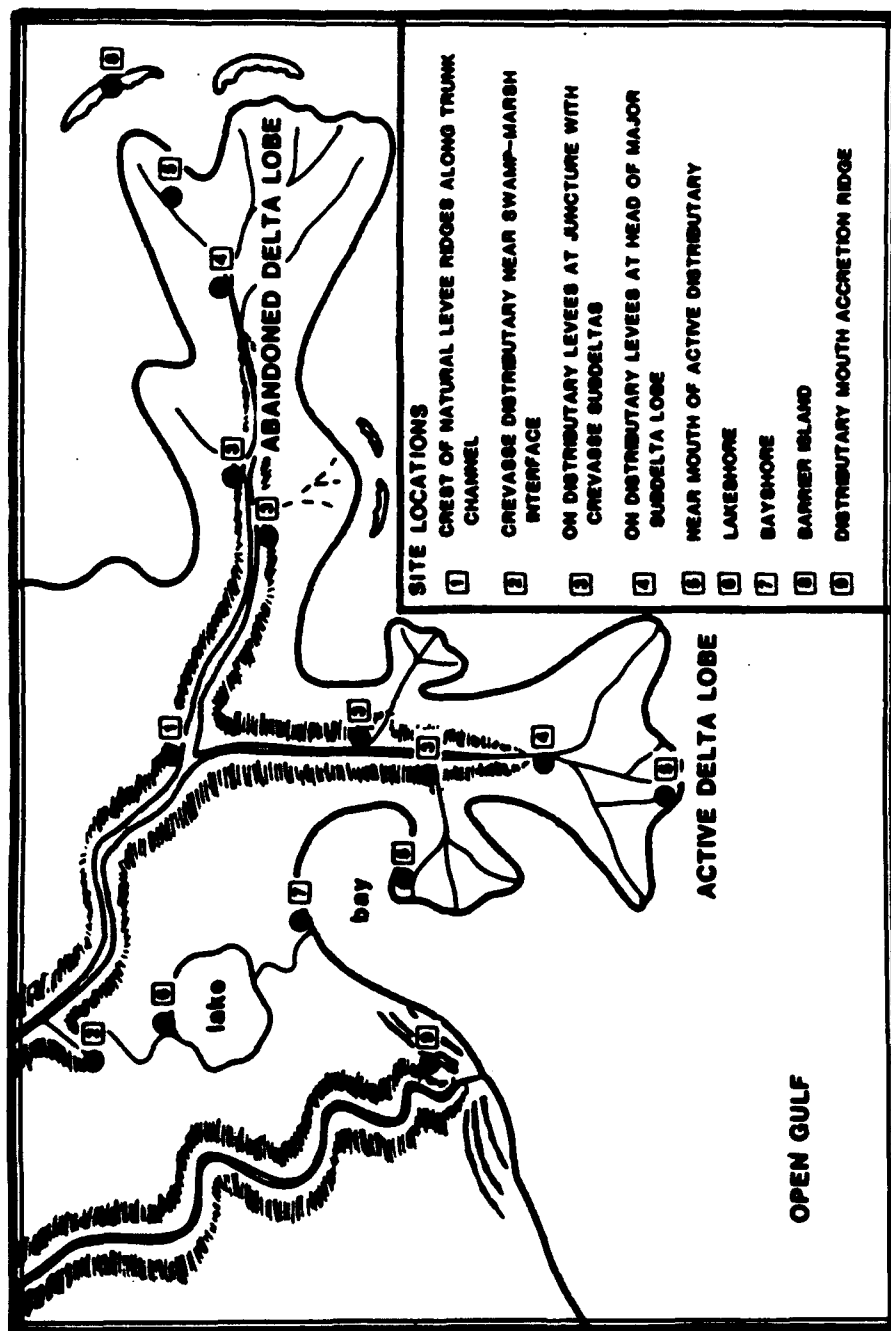


FIGURE 18: Site probability within a distributary system (from Gagliano 1984).

The elevated natural terrain features located in the study area east of the back protection levee would provide sites with access to lacustrine and other resources. Water-borne transportation to the Mississippi would have been possible during the active life of the Proctor Point distributary. The sites recovered in this region are on or near the present shores of Lake Borgne, and their distribution suggests the choice of locales in proximity to the lake on waterways offering direct routes to it. The cluster of middens at 16SB39 suggests that a high population density could have been sustained at this or comparable favored locales, although regional population density may have been low. Riverine or coastal trade may have presented another incentive for location of sites on waterways near the coast, but we lack adequate data for evaluating the importance of this factor.

The present upper courses of Bayou Dupre and interconnecting marshland channels do not exhibit extensive deposition of levee deposits, judging by the negative evidence for forest cover in topographical maps or air photos. These minor stream channels probably are of recent geological origin. These courses are not associated with natural landforms of sufficient elevation to constitute high probability areas.

Archeological Expectations - Historic Remains:

Historic archeological sites tentatively located within the project area to date can be divided into two classes: plantations and plantation-related remains within the river corridor, between the present Mississippi River channel and the back protection levee, and fortifications or associated military activity areas between the back protection levee and the Mississippi River Gulf Outlet. A third class of historic features found within the project area are cypress lumber logging tracks, which represent commercial exploitation of the area's forest resources through a complex industrial technology. The logging tracks are not located in the central construction corridor of the proposed waterway, but in the designated construction and maintenance disposal areas flanking the route's axis. Although these railroad logging scars have been identified as potential cultural resource areas by previous investigators (Wicker et al. 1982: fig. 2-48), they have not themselves been designated as archeological sites. Other transportation features traversing the study area - roads, railroads, and canals - likewise present probable venues for the recovery of historic material, but will not be treated as sites.

The river corridor of the project area includes portions of Sections 8, 9, 10 and 11, T13S, R13E. Portions of this area have been utilized for plantation agriculture since the colonial period. A recent study of this portion of the Mississippi indicates that the riverbank near the head of the Lake Borgne Canal has remained stable since 1830, but documents extensive erosion in the sectors upriver and downriver from that locality between 1853 and 1979 (Iroquois Research Institute 1982: 16-17). Some destruction of historic remains along the river frontage of the river probably has occurred. Two sites are recorded within or in proximity to the study area near the Mississippi River.

Site 16SB102, Merits (sic) Plantation, lies immediately upriver from the proposed river access corridor. The site area, as defined by bulldozed brick rubble and historic artifact assemblages on the ground surface, occupies the area between the modern Mississippi River levee and the old St. Bernard Highway (River Road) along the riverfront of Violet. The state site files do not indicate what relation 16SB102 bears to the Philippon Plantation slave quarters at Violet (Burk & Associates, Inc. n.d.: map 10). As delineated in the state site files, the plantation remains do not extend farther downriver than the Merrick (sic) Cemetery. The project's proposed river corridor lies entirely downriver of that cemetery and therefore may not impact the plantation site.

Site 16SB101, the Reunion Plantation site, is located by the Mississippi River levee near river mile 82.8. No information regarding intact cultural features is available on this site, identified by reference to an 1893 map. The site is located near the community of River Bend and thus is outside the probable impact zone.

The riverfront segment of the study area will thus miss the central habitation and production areas of the plantations it traverses, but attention should be directed toward outlying plantation features frequently ignored by historic map coverage. Slave cemeteries are seldom indicated on plantation plans; they often were placed near the end of the slave quarters but their location cannot be confidently predicted in the absence of documentary evidence. The pattern of plantation drainage ditches and furrows can be recorded in the field, the ditches (or irrigation canals) representing a venue for the recovery of associated historic features or material.

The plantation field system did not extend back from the river to the Forty Arpent Canal (along the riverward side of the modern back protection levee) in the 1890s. In that period rice rather than sugarcane was cultivated in the plantations between Violet and Poydras. Poydras Hall Plantation, located on the higher levee soils at the head of Bayou Terre aux Boeufs, was in contrast a major sugar producer at the time (Mississippi River Commission Chart No. 77, 1893). The low lying rear areas of Sections 8, 9, 10 and 11 have been of marginal agricultural value; recent air photos indicate that this portion of the project area's river corridor is wooded or in partially wooded pasture (1978 and 1985 infrared photo series, consulted at the C.O.E. New Orleans District office).

The British army stationed a unit of Negro soldiers at the Philippon Plantation (later the Merritt Plantation) during the New Orleans campaign of December 1814 - January 1815 (Latour 1816). This detachment was an outlying guard force; there is no evidence that they erected any fortifications while encamped there. Military hardware associated with this group, or with American units present in the area during the same campaign, may be recovered in fieldwork. There is no record of Civil War encampments or engagements in this vicinity.

The project's river corridor will not impact the Lake Borgne Canal between the Mississippi River and the back protection levee. This segment of the canal is the locale

of documented industrial and shipping facilities associated with the waterway, including 16SB105 (the twentieth century canal lock) and 16 SB 123 (the Guichard Plantation mill remains). Development of the Violet/Borgnemouth community did not extend into the project area. The Violet school, an isolated structure on the old St. Bernard Highway between Violet and River Bend, lies on the axis of the proposed waterway but is not architecturally or historically significant.

The primary locus of historic activity in the portion of the project area between the back protection levee and the Mississippi River Gulf Outlet is along the banks of Bayou Dupre, including its channelized course and the cutoffs created by channel straightening. The only reported historic site in this area is 16SB89, the Lake Borgne Canal Redoubt. This strongpoint was constructed by order of General Andrew Jackson in early 1815 to guard against British incursions up Bayou Dupre subsequent to their withdrawal from the Chalmette battlefield (Latour 1816). There is no record of American or British use of the Bayou Dupre route between Lake Borgne and the Mississippi during the New Orleans campaign. American forces were withdrawn from this locale early in 1815 and the redoubt was not maintained thereafter.

A township plat of T13S, R13E, surveyed between 1829 and 1831, notes the redoubt as "old fort" (Figure 15). This land survey probably represents its position more reliably than does Latour's map of 1816, although the "old fort" lies on the unsurveyed or incompletely surveyed section line between Section 25 and Section 26. The redoubt was located on the north side of Bayou Dupre, at or near the head of navigation. A sawmill canal on the Philippon Plantation led from the Mississippi River to the head of Bayou Dupre near the site; the Americans constructed the fortification to block British utilization of this corridor of approach to the river. As delineated in Latour's 1816 map and the 1829-1831 township plat, allowing for some degree of inaccuracy in both documents, the site of the redoubt was between 1.5 and 2 miles from the Mississippi River.

The locale reported in the state site files as the redoubt, 2.6 miles from the Mississippi River along the present Lake Borgne Canal, does not fit convincingly with the fortification's recorded position. Site 16SB89 is on the north side of the canal near the present head of Bayou Dupre, and the site may have been recorded erroneously here due to the misidentification of this spot with the locale delineated on historic maps. The site's location was provided by a local informant and has not been verified in the field. During the dredging of the Lake Borgne Canal the earlier channel of the Philippon sawmill canal was deepened and extended farther lakewards into the marshland, cutting off the shallow meandering headwaters of Bayou Dupre. The true location of the redoubt therefore lies closer to the Mississippi than does the reported site.

A review of historic maps and relevant drainage features suggests that the redoubt was located between 9,000 feet and 10,500 feet from the river along the Lake Borgne Canal. The shorter distance places the site near a southern tributary of Bayou Dupre

indicated on the early maps. This tributary drains lakewards from the vicinity of the Merritt Cemetery in Section 8 and can be readily detected on air photos by the trees occupying its banks (1978 and 1985 infrared photo series, consulted at the C.O.E. New Orleans District office). The elevation of this terrain feature is less than one foot above the surrounding land surface, but provides a significant contour demarcation in this lowlying area (Wicker et al. 1982: fig. 4-3). The segment of this tributary intersecting the south side of the Lake Borgne Canal was designated "Merits (sic) Canal" in the 1890s. The nomenclature need not indicate that this waterway east of the Forty Arpent Canal was a cultural feature, but that it was utilized for plantation drainage.

East (lakewards) of "Merits Canal" was "Crosstie Bayou," likewise intersecting the south side of the Lake Borgne Canal (Mississippi River Commission Chart No. 77, 1893). Crosstie Bayou probably is the upper end of a meandering cutoff course of Bayou Dupre created by the dredging of the navigation canal. The antebellum maps suggest that the American redoubt was located along the present course of the Lake Borgne Canal between Merits Canal and Crosstie Bayou. Remains of the fortifications may be encountered in this vicinity, but it is likely that the redoubt was destroyed by the extension of the Lake Borgne Canal eastward from the 1815 terminus of the Philippon Plantation sawmill canal, or by subsequent widening of the waterway (Wicker et al. 1982: 72).

There currently are a number of structures along the banks of Horseshoe Bayou (Bayou Dupre cutoff), but these are modern facilities related to local hunting and fishing. There is no record of any navigation-related facility on the Lake Borgne Canal - Bayou Dupre course within the project area. The Violet Alternative would not impact the recently constructed Bayou Dupre Control Structure at the MRGO.

The railroad logging tracks found within the study area diffuse from two discrete trunk lines. These trunk lines lead from the high natural levees into the backswamp cypress forest. One of the two lines, that upriver of the Lake Borgne Canal, extended northeast along the course of Bayou Chaperon into Section 22, T13S, R13E. Three parallel logging tracks extend southeast from this primary trunk line into Sections 24 and 25-26-27. The central logging track serves as a secondary trunk line; it reaches as far as the unnamed bayou draining into Horseshoe Bayou and turns toward the lake. Two additional logging tracks extend southeast from this secondary trunk line and cross the unnamed bayou (See Figure 19).

The trunk line downriver of the Lake Borgne Canal extended east from the vicinity of River Bend into T13S, R14E. The project area includes part of the trunk line near the lakeward side of the Forty Arpent Canal and the northern ends of several logging tracks which extend toward Bayou Dupre from the trunk line. Most of the forest area exploited by this trunk line lies outside the study area.

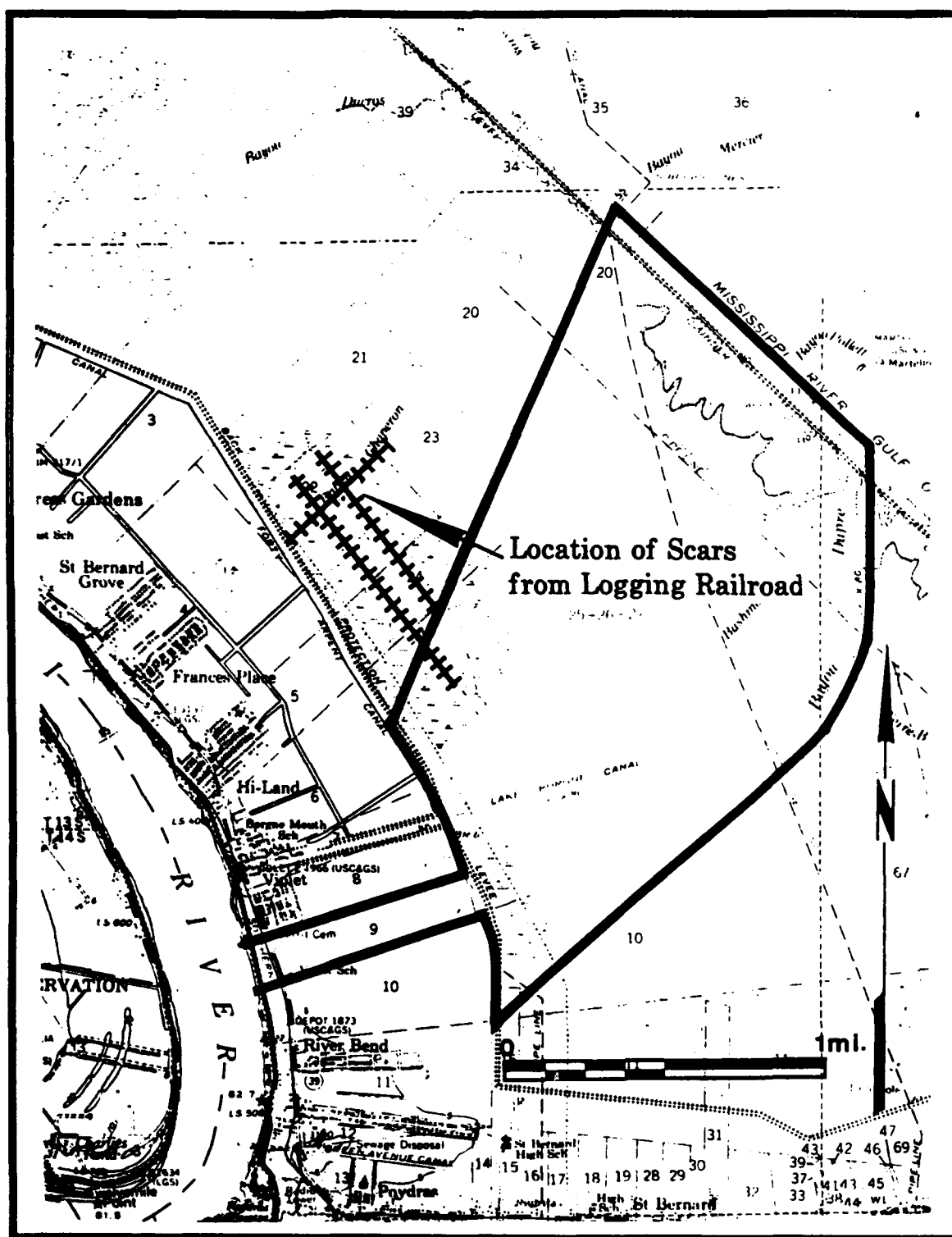


FIGURE 19: Location of logging railroad as determined by scars on landscape detected in aerial photographs. Source: New Orleans District, U.S. Army Corp of Engineers; Wicker et al 1982).

The logging tracks terminate near the former boundary between cypress swamp and coastal marsh. Marshland constitutes most of the study area east of the back protection levee; the designated spoil disposal areas would impact only a small fraction of the multi-branched railroad networks. No structures have been identified along the lines of these abandoned logging railroads. The scars left by the railroad tracks provide a record of the historic extent of cypress forest, but little cultural material is expected along these features. Remains of railroad bridges across the unnamed bayou in Sections 25-26-27 may survive in situ; these locales should be investigated.

The proximity of both the primary trunk lines to Violet/Borgnemouth suggests that no major logging camps were developed within the project area, as occurred in more isolated zones. An unconfirmed logging camp site has been reported to the east of the study area, in a sector where pullboat logging techniques were employed (Wicker et al. 1982: 72). Borgnemouth was a hamlet at the head of the Lake Borgne Canal prior to its development as an industrial cypress mill town. The mill here reportedly utilized only railroad logging methods in harvesting timber, rather than pullboat techniques on canals or natural waterways (Mancil 1972: Vol. 1; 6, 195). Pullboat logging scars radiating from historic canals have been identified just a few kilometers east of the study area (Wicker et al. 1982: Fig. 2-48). These canals are accessible from the Lake Borgne Canal via Terre Beau Bayou, a navigable waterway connecting with Bayou Dupre; timber might have been transported to the Borgnemouth cypress mill by canal as well as by railroad. As none of these logging canals or pullboat logging scars lie within the project area, they do not influence the research design.

Statistical Evaluation:

The proposed study has two main objectives. The primary objective of the fieldwork is to locate unrecorded archaeological materials, utilizing stratified sampling methods based on a geomorphological site prediction model. The secondary objective is to provide data to enable statistical testing of the model's validity. Given the constraints imposed by sampling the marshland sector, and the resources of the project, the proposed methodologies will maximize the probability of locating unrecorded archaeological sites, assuming the model is correct.

In terms of collecting information to test the validity of the proposed model, sampling along the Lake Borgne Canal and the Pipeline Canal provide opportunities to obtain samples from high and low probability areas as determined by the model. However, it is difficult to ascertain whether samples taken along these transects through the marsh would provide sufficient information to statistically validate such a model. Validation may require more extensive sampling, such that the successful number of archeological locations is increased.

In short, analysis of the geomorphological, historic and prehistoric information, and consideration of the amount of land surface involved, makes it seem unlikely that the model will be amenable to statistical testing, unless an inordinate amount of time, money, and effort is expended in the sampling process.

CHAPTER EIGHT:

FIELD METHODOLOGY

by

Kenneth Jones and Malcolm Shuman

The Violet Alternative study area is composed of two clearly demarcated areas, which have been altered by human activity in distinctive ways. The project area's boundaries are subject to revision prior to performance of field operations, and estimates of the total land area involved therefore are tentative. The riverfront segment as delineated on current engineering plans measures approximately 3000 ft (915 m) along the river and 8000 ft (2440 m) in depth from the river, an area of about 550 acres (223 hectares). In calculating the area of the rear segment the boundaries have been interpreted more fluidly to allow for some revision of the designated spoil disposal areas. This portion of the study area thus entails a landsurface of roughly 8.75 sq mi, or 5600 acres (2266 hectares).

The project's river access corridor between the Mississippi River and the back protection levee has been extensively modified by plantation agriculture. The back protection levee occupies the lakeside bank of the Forty Arpent Canal, which lies approximately at the rear boundary of early riverfront land grants in this region, including Sections 8, 9, 10 and 11 in this locale. Although drainage ditch systems and land clearance did not extend as far back from the river as the Forty Arpent Canal throughout these sections, the total land surface is accessible on foot from the river. The full depth of this corridor has been utilized in the twentieth century for field agriculture or pasturage.

The slope from the crown of the natural river levee toward the lake is relatively uniform in this area; the Bayou Dupre tributary in Section 8 is a minor landscape feature. The probability of recovering archeological remains in the river corridor falls sharply with distance from the Mississippi River. All the primary historic transportation routes - the River Road, the Shell Beach Railroad and the river landings - were located at the riverbank and on the nearby crown of the natural levee.

A uniform regime of pedestrian survey is recommended for the entire river corridor. A series of parallel survey transects 30 m apart, between the riverbank and the Forty Arpent Canal, would provide well-defined terminal points for the survey corridor and would blanket the segment most efficiently. These transects would follow the orientation of the upriver and downriver boundaries of the river access corridor. Most of the plantation ditch systems consist of drainage channels running back from the levee toward the lake, so a river to lake transect grid orientation should present field crews with a minimum of ditch crossings.

Pedestrian survey would involve surface inspection and subsurface shovel testing at intervals of 50 m along each transect. Shovel tests will be 30 x 30 cm wide and 50 cm deep, unless ground water prevents excavation to that depth. Additional shovel tests may be placed wherever cultural remains are observed. Exposed banks of ditches or other features will be inspected for evidence of subsurface remains. This survey regime will provide complete coverage of the historic plantation activity areas.

Deep auger tests, to a minimum depth of 2 m, will be placed judgmentally in the river segment. Most or all of these auger tests probably will be placed near the riverbank or the historic highway, but they may be located at the discretion of the field crew to ascertain the stratigraphic depth of any cultural remains or features. Excavation units not less than 1 m x 1 m in area will be placed in areas of prehistoric or historic remains, should they be encountered. The fieldcrew will investigate the reported location of Reunion Plantation (16SB101) to determine the site boundaries and provide an update for the state site files. Should this site be wholly outside the study area, the pedestrian survey here will be limited to surface observation and recordation. If the study area includes all or part of the archeological site, the site area will be documented and tested by the full regime of pedestrian survey, deep auger testing and hand excavation of judgmentally placed units applied in the remainder of the river segment.

The fieldcrew also will inspect the full length of riverbank within the corridor. It is recommended that this phase of research be conducted only during a low river stage on the Mississippi to provide the greatest possible extent of bankline exposure. No archeological remains were recorded on the batture by Iroquois Research Institute but erosion and construction of the Poydras Revetment may have revealed material since the completion of their fieldwork in 1981.

The pedestrian survey regime proposed for the river access corridor is not feasible for the inundated zone behind the back protection levee. The primary ecological constituent of this sector is marshland; much of the land along the major waterways has been utilized for disposal of dredge spoil, burying the original ground surface. The most effective method for investigation of archeological materials in this zone is the inspection of exposed banklines from small boats. A shallow-draft boat would be able to follow pipeline canals and the courses of tributary bayous as well as presently maintained navigation channels.

The fieldcrew will conduct shovel testing and deep auger testing of elevated terrain features with shovel tests placed at 30 m intervals, where such terrain features are identified and the crew is able to disembark. Careful examination will be made of any shell observed during bankline or spoil deposit inspection, and its original stratigraphic position ascertained if possible. Some redeposited midden material may retain its associative integrity as a block unit. Hand excavation of stratigraphic profiles may be possible at some bankside locations. The high water table throughout this sector probably would prevent unit excavation without the employment of water pumps. Soil samples and flotation samples will be taken from hand-excavated units. Soil samples will be taken from the stratigraphic units observed in deep auger tests and in profiles. Radiocarbon samples and shell samples will be collected from midden deposits, should those be encountered.

The fieldcrew may observe historic material (abandoned ships, pilings, etc.) in waterways or permanently inundated areas. The field crew will utilize a small boat to navigate the bayous and canals within the study area. The crew may observe cultural materials exposed within the banks of these waterways or within the dredgespoil brought up from the channel beds. The crew will collect cultural materials from these contexts. The fieldcrew probably will not be able to conduct shovel testing or soil augering along the routes of pipeline and secondary canals, as these generally traverse lowlying areas. Only where the canals cut through higher terrain can such testing be conducted, and it might be prevented in these locales by overburden of spoil. Along the bayou watercourses, shovel testing and stratigraphic excavation can be conducted where cultural materials are observed. A general regime of shovel testing is not recommended in this environment as exposure of material along the waterways should provide a more reliable indication of near-surface sites than would shallow excavation. The fieldcrew will conduct bayouside observation at low water stages, should the tidal stages prove significant for bankline canals. At no time should magnetometer surveys be necessary in the modern pipeline canals, but they will be conducted in the bayous.

The Lake Borgne Canal - Bayou Dupre channel, Horseshoe Bayou, Bashman Bayou and that portion of Terre Beau Bayou within the study area are the primary waterways to be surveyed by boat. Other major tributary bayous would be investigated if accessible. Two particularly significant courses which are now minor waterways - the upper cutoff of Bayou Dupre, tentatively identified above with Crosstie Bayou, and the unnamed southwestern tributary of Horseshoe Bayou - would also be surveyed. A major pipeline canal traverses the study area from north to south; another canal borders the existing spoil deposit area on the south (river) side of the Mississippi River Gulf Outlet. The banklines of these canals, and of secondary canals connecting with them, would be surveyed by boat. During small boat survey operations the crew should consist of a minimum of three individuals trained in first aid and lifesaving techniques, in order to provide rescue service in case of accidents in the field. If a least one of the crew of three is able to operate the boat, then the other two individuals can scan both banksides

while passing through narrow waterways. A fourth crew member can be added to act as lookout for navigational obstructions if desired, but this should not be necessary for the operation of a shallow-draft boat at low speed. If none of the archaeological field personnel are experienced boat handlers, then a hired boat operator can be employed in addition to the three-person fieldcrew. As much of the survey work will consist of bankline observation, at times with no shovel testing component, fielding a crew of more than three or four people would not be cost-effective. During the marine magnetometer survey, a separate phase of research, the field crew will consist of the operator and his assistants. The crew size will not exceed four, including a qualified boat handler. The south side of the MRGO will be impacted by the Violet Alternative for a distance of about 8000 feet (2632 meters) west of the Bayou Dupre Control Structure; this segment of the MRGO bankline will likewise be surveyed.

The Lake Borgne Canal - Bayou Dupre navigation channel provides the primary locus for historic activity within this sector of the project area, but recovery of archeological remains may be possible only through identification of artifacts in dredge spoil deposits. The banks of the canal and portions of the channelized bayou course are covered with spoil to a varying depth. The dredged material may reveal buried sites in the bed of the waterway or underwater remains associated with Bayou Dupre, but reduces the likelihood of recovering material from the original ground surface. Inspection of the canal banks by boat should reveal any in situ cultural features or material exposed by canal excavation or subsequent erosion. A general pedestrian survey of the canal banks is not recommended. Survey teams may disembark from their boat to investigate any bankline area where cultural material is observed, or where the terrain and vegetation indicate an elevated natural landform. Systematic pedestrian survey and subsurface testing will be conducted in these locales.

The putative site of 16SB89 reported in the state site files will be tested. The fortification or associated material should be revealed by examination of the canal banks, if not wholly destroyed by dredging. Should no bankside remains of the American redoubt be observed, a pedestrian survey will be conducted of the site area proposed in this research design. The designated area lies between 9000 and 10,500 ft from the Mississippi River along the canal, and extends 50 m north and south of the present canalbanks. As the redoubt lay on or near the present alignment of the canal, any surviving portion of the earthworks or associated activity areas should be located within this survey corridor. Due to uneven spoil deposition, shovel tests would be placed judgmentally rather than at 50 m intervals in this bankline area. If no archeological evidence for the redoubt is located anywhere along the Lake Borgne Canal, its location must remain ambiguous.

The fieldcrew also will visit the Horseshoe Bayou site (16SB100). As the last update on this site reports that a camp had been built over it and that no archeological remains were visible, there may be no opportunity to recover additional data on the site. Should the unnamed southwestern tributary of Horseshoe Bayou prove to be inaccessible

by boat, the fieldcrew will attempt to reach its course via the roadbed of the abandoned logging railroad discussed above. The importance of this bayou as the postulated channel of the Proctor Point distributary justifies the required effort to reach it and to conduct deep auger testing at judgmentally chosen locales along its banks. A line of soil cores perpendicular to the course of the bayou would determine the width of its natural levee deposits; a hand-transported auger probably is inadequate for that task.

The presence of numerous artificial channels within the study area should provide a balanced coverage of the marshland and backswamp forest zones. If the investigation included only the banklines of currently identified natural waterways and higher terrain features along them, the predictive model for site location could be supported by a self-fulfilling constraint on investigation precluding negativity. Canal excavation has exposed subsurface material in a pattern random to that of the contemporary surface landforms, thus generating a check on the reality of the predictive model. The research design thus presents an hypothesis which can be tested through a strategy of covering both high and low probability areas. The criteria of falsifiability is thus satisfied, as data acquisition will not be weighted to prove or disprove the hypothesis advanced. The use of pipeline canals for bankline/spoil deposit inspection is an opportunistic research strategy, providing access to subsurface archeological remains otherwise unavailable. A review of archeological research in comparable areas of Terrebonne Parish indicates that boat-based investigation of banklines and spoil deposit areas is the most efficient and least biased method of survey methodology in the marshland environment (Stout 1988: 7).

The probability of recovering historic shipwrecks or navigational structures with the Lake Borgne Canal is low. The waterway remained a narrow channel during the operation of the river lock at Violet, and ship remains within the canal would have constituted an obstruction to shipping and therefore probably would have been removed. Sunk ships and shipping-related structures (docks, pilings for navigation light, tidal locks, etc.) are more likely to be found in the bayous intersecting the canal, especially near fishing camps. The survey crew may directly observe shipwrecks or underwater structural remains during boat surveys, or may identify marine remains within dredgespoil. In addition, a magnetometer survey will be conducted along the Lake Borgne Canal and the navigable waterways within the study area. No such survey is recommended for the pipeline canals within the area, as there is low probability of historic marine remains in these recently constructed features. Local informants may be able to identify modern sunken ships or structures located during the marine study, or evidence of underwater remains be observed directly, a crew including a certified diver and a marine archeologist shall return to the locale to record the remains.

The program of field research presented above focuses on the recovery of information on several key themes for the understanding of Louisiana's cultural heritage. Although unanticipated types of archeological remains may be encountered during fieldwork, the strategy employed in the execution of field investigations should seek to maximize the data return from known or expected archeological sites without biased data

sampling. The 100% pedestrian survey regime utilized in the study area's river access corridor should yield information on field patterns and other features related to the functional layout of riverside plantations. The boat-based bankline inspection technique employed in the wetlands zone behind the back protection levee should provide the fullest opportunity to examine exposed site material, especially subsurface prehistoric midden exposed in dredge spoil. This might include cultural remains as early as the Poverty Point Period, but more probably later assemblages such as those exhibited by the sites clustered about Shell Beach Bayou.

The presence of subsurface prehistoric material within the study area is predicated on the identification of a relict distributary of the Mississippi River. The age of archeological assemblages from the natural levees of this course may serve as a critical test case for the postulated preferential occupation of mature or declining delta lobes. Plantation archeology and prehistoric adaptations to the changing delta environment are among the key cultural themes recommended for investigation in this region by the state archeological plan (Smith et al. 1983: 97-98).

A thorough bankline inspection of the Lake Borgne Canal and appropriate subsurface testing will be conducted in the reported and postulated locations of the 1815 American redoubt. The site's association with the New Orleans campaign of 1814-1815 gives it historic significance under Criterion A of the National Park Service's standards for National Register evaluation. It is probable that the redoubt has been destroyed by canal construction and subsequent bankline erosion, but any remains of the fortification or associated materials will be fully documented for determination of the site's integrity. No historic standing structures are documented within the study area. Historic marine remains may be encountered during survey work, but are not anticipated.

The likelihood of encountering previously unrecorded archeological sites is probably in the range of 50%. Prehistoric sites may exist along the relict distributary channel, but their discovery is dependent on the exposure of subsurface soil containing cultural remains. A military encampment or slave cemeteries may be found within the study area's river corridor, but are low probability discoveries. Irrigation flumes and the foundations or structural debris of plantation outbuildings are more likely to be recovered in this sector.

REFERENCES CITED

- Adams, R.D.; B.B. Barrett; J. H. Blackmon; B.W. Gane; W.G. McIntire
- 1976 *Barataria Basin: Geologic Processes and framework*. Louisiana State University, Center for Wetland Resources, Sea Grant Publication No. LSU-T-76-006.
- Bahr, Leonard M. Jr., R. Costanza, J.W. Day, Jr., S.E. Bayley, C. Neill, S.G. Leibowitz, and J. Fruci
- 1983 *Ecological Characterization of the Mississippi Deltaic Plain Region: a narative with Management Recommendations*. U.S. Fish and Wildlife Service, Division of Biological Services, Washington, D.C. FWS/OBS - 82/69.
- Beavers, Richard C. (contributions by T.R. Lamb, G.B. DeMarcay, and K.J. Johnson)
- 1982 *Archaeological Site Inventory, Barataria Basin March Unit - Core Area, Jean Lafitte National Historical Park, Jefferson Parish, Louisiana*. Report submitted to the National Park Service, Jean Lafitte National Historial Park, New Orleans.
- Bouchereau, Alcee
- 1868- *Statement of the Sugar Crop Made in Louisiana*. New Orleans:
1917 M.F. Dunn and Brothers.
- Brown, Ian W.
- 1984 *Late Prehistory in Coastal Louisiana: The Coles Creek Period*. In *Perspective on Gulf Coast Prehistory*. Dave D. Davis (ed), University of Florida Press, Gainesville.
- Burk & Associates, Inc.
- n.d. *Louisiana Coastal Resources Atlas: St. Bernard Parish*. Prepared for the Louisiana Department of Transportation and Development, Baton Rouge.

Casey, Powell A.

- 1983 *Encyclopedia of Forts, Posts, Named Camps, and Other Military Installations in Louisiana, 1970-1981*. Baton Rouge: Claitor's.

Champomier, P.A.

- 1984-1862 *Statement of the Sugar Crop*. New Orleans: Magner and Wessen

Ducros, Joseph Emile and Henry J. Stouse

- 1976 *The Genealogy of the Descendants of Joseph Marius Ducros. New Orleans Genesis 15*.

Eastern New Mexico State University

- 1987 *Southeast Louisiana Cultural Resource Management Plan*. 1988. Unpublished report submitted to the Corps of Engineers, New Orleans District.

Fisk, H.N.

- 1944 *Geological Investigation of the Alluvial Valley of the Lower Mississippi River*. Mississippi River Commission, U.S. Army Corps of Engineers, Vicksburg District. 78 pp.

Floyd, Robert J.

- 1981 *Cultural Resources Survey of Proposed 24" Pipeline Route from Loop's Clovelly Facilities Lafourche Parish, La. to Gulf Oil's Alliance Refinery Plaquemines Parish, La. to Murphy Oil's Meraux Refinery St. Bernard Parish, La. for Gulf Refining Co.* Unpublished report on file with the Division of Archaeology, State of Louisiana.

Frazier, David E.

- 1967 *Recent deltaic deposits of the Mississippi River: their development and chronology. Transactions of the Gulf Coast Association of Geological Societies*.

Gagliano, Sherwood M., Richard A. Weinstein & Eileen K. Burden

- 1975 *Archaeological Investigations Along the Gulf Intracoastal Waterway: Coastal Louisiana Area*. Unpublished report on file with the Division of Archaeology, Baton Rouge.

Gagliano, Sherwood M., Klaus J. Meyer-Arendt, and K.M. Wicker

- 1981 Land loss in the Mississippi River deltaic plain. *Transactions of the Gulf Coast Association of Geological Societies* 31: 295-300.

Gagliano, Sherwood M. and R.A. Weinstein

- n.d. The Buras Mounds: A Lower Mississippi River Delta Mound Group, Plaquemines Parish, Louisiana. Appendix A in *A Cultural Resources Survey of the Empire to the Gulf of Mexico Waterway*. Sherwood Gagliano (ed.). Report submitted to the U.S. Army Corp of Engineers, New Orleans District.

Gagliano, Sherwood M., R.A. Weinstein, E.K. Burden, K.L. Brooks, and W.P. Glander

- 1979 *Cultural Resources Survey of the Barataria, Segnette, and Rigaud Waterways, Jefferson Parish, Louisiana*. Prepared by the New Orleans District U.S. Army Corps of Engineers.

Giardino, Marco J.

- n.d. *Overview of the Archaeology of the Coquilles Site, Barataria Unit, Jean Lafitte National Historical Park, Louisiana*. Submitted to the National Historical Park, New Orleans.
- 1984a *Report on the Ceramic Materials from the Coquille Site (16JE37), Barataria nit, Jean Lafitte National Historical Park*, Submitted to the National Park Service, Jean Lafitte National Historical Park, New Orleans.
- 1984b Documentary Evidence for the Location of Historic Indian Villages in the Mississippi Delta. In *Perspective on Gulf Coast Prehistory*, Dave Davis editor, pp. 232-257. University of Florida Press, Gainesville.

Haag, William G.

- 1971 *Louisiana In North American Prehistory. Melanges No. 1.* Museum of Geoscience, Louisiana State University, Baton Rouge.

Hansen, Harry (ed.)

- 1941 *Louisiana: A Guide to the State.* New York: Hastings House.

Howard, Perry C., Thomas J. Duenckel, Sherwood M. Gagliano, Greg J. Gaspercecz and John C. Leslie

- 1984 *The Mississippi River Guld Outlet: A Study of Bank Stabilization.* Prepared for the St. Bernard Parish Police Jury by Coastal Environments, Inc., Baton Rouge.

Iroquois Research Institute

- 1982a *Cultural Resources Survey of Fourteen Mississippi River Levee and Revetment Items.* Submitted to the U.S. Army Corps of Engineers, New Orleans District.

Jones, Dennis C. and Malcolm K. Shuman

- 1988 *Archaeological Atlas and Report of Prehistoric Indian Mounds in Louisiana: Vol. III: Livingston, St. Helena, St. Tammany, Tangipahoa, Washington Parishes.* Unpublished Report in the files of the Division of Archaeology, Department of Culture, Recreation and Tourism.

Keown, M.P., E.A. Dardeau, Jr. and E.M. Causey

- 1986 Historic trends in the sediment flow regime of the Mississippi River. *Water Resources Research* 22:1555-1564.

Kniffen, Fred B.

- 1936 Preliminary Report on the Indian Mounds and Middens of Plaquemines and St. Bernard Parishes. *Report on the Geology of Plaquemine and St. Bernard Parishes.* Department of Conservation, Louisiana Geological Survey, Geological Bulletin No. 13, pp. 189-207. New Orleans.

Kniffen, Fred B., H.F. Gregory and G.A. Stokes

- 1987 *The Historic Indian Tribes of Louisiana From 1542 to Present.*
Louisiana State University Press, Baton Rouge.

Kolb, C.R.

- 1958 Geological Investigation of the Mississippi River Gulf Outlet
Channel. *U.S. Army Engineer Waterways Experiment Station,*
Miscellaneous Paper No. 3-259. Vicksburg, MS.

Kolb, C.R. and Roger R. Saucier

- 1982 Engineer Geology of New Orleans: Review. *Engineering Geology*
5: 75-93.

Kolb, C.R., F.L. Smith and R.C. Silva

- 1975 Pleistocene sediments of the New Orleans-Lake Pontchartrain Area.
U.S. Army Engineer Waterways Experiment Station, Technical
Report No. S-75-6. Vicksburg, MS.

Kolb, C.R. and J.R. Van Lopik

- 1958 Geology of the Mississippi River Deltaic Plain, Southeastern
Louisiana. *U.S. Army Waterways Experiment Station.* Technical
Report No. 3-259. Vicksburg, MS.

Kwon, H.J.

- 1969 *Barrier Islands of the Northern Gulf of Mexico Coast.* Louisiana
State University Press, Coastal Studies Series No. 25. Baton
Rouge.

Latour, Arsene Lacarriere

- 1816 *Historic Memoir of the War in West Florida and Louisiana in 1814-*
15. Translated by H.P. Nugent. John Conrad and Co., Philadelphia.

McIntire, William G.

- 1958 *Prehistoric Indian Settlements of the Changing Mississippi River Delta*. Baton Rouge: Louisiana State University Press, Baton Rouge.

McWilliams, Richebourg Gaillard, ed.

- 1981 *Iberville's Gulf Journals*. University of Alabama Press, Tuscaloosa.

Maduell, Charles P.

- 1972 *The Census Tables for the French Colony of Louisiana from 1699-1732*. Baltimore: Genealogical Publishing Co.

Mancil, Ervin

- 1972 *An Historic Geography of Industrial Cypress Lumbering in Louisiana*. Ph.D. Dissertation, Louisiana State University, Baton Rouge.

May, John R. and Louis D. Britsch

- 1987 *Geological Investigation of the Mississippi River Deltaic Plain: Land Loss and Land Accretion*. U.S. Army Corps of Engineers Technical Report GL-87-13. Prepared for the New Orleans District by the Dept. of the Army, Waterways Experiment Station, Corps of Engineers, Vicksburg.

Menn, Joseph Karl

- 1964 *The Large Slaveholders of Louisiana, 1860*. New Orleans: Pelican Publishing Co.

Meyer, J. Ben

- 1975 *Railroads of the Delta*. Buras: Plaquemines Parish Library.

Miller, C.F.

- 1956 Life 8000 years ago uncovered in an Alabama Cave. *National Geographic* 110: 542-58.

Mossa, Joann

- 1989 Geomorphology of the lower Mississippi River from Algiers to English Turn. In *Cultural Resources Survey of Four Revetment Items Below New Orleans (Draft Report)*. (H.A. Franks and J.K. Yakubik, eds.), pp.5-30. U.S. Army Engineer District, New Orleans.

Neuman, Robert W.

- 1977 *An Archaeological Assessment of Coastal Louisiana*. Melanges No. 11. Museum of Geoscience, Louisiana State University, Baton Rouge.
- 1984 *An Introduction to Louisiana Archaeology*. Baton Rouge, Louisiana State University Press.

Nummendal, Dag

- 1983 Future Sea Level changes along the Louisiana Coast. *Shore and Beach*. 51(2): 10-15.

Penland, S.P., R. Boyd, Dag Nummendal, and H.H. Roberts

- 1981 Deltaic Barrier Development on the Louisiana Coast. *Supplement to Transactions of the Gulf Coast Association of Geological Societies* 31: 471-476.

Quimby, George I.

- 1951 The Medora Site, West Baton Rouge Parish, Louisiana. *Anthropological Series, Field Museum of Natural History* 24: 81-155.
- 1957 The Bayou Goula Site, Iberville Parish, Louisiana. *Fieldiana: Anthropology* 47: 91-170.

Ramsey, K.E. and T.F. Moslow

- 1987 A numerical analysis of subsidence and sea level rise in Louisiana. *Coastal Sediments '87*. American Society of Civil Engineers, pp. 1673-1688.

Reed, Merl E.

- 1966 *New Orleans and the Railroads: The Struggle for Commercial Empire, 1830-1860.* Baton Rouge: Louisiana State University Press.

Robinson, Willard B.

- 1977 Maritime Frontier Engineering: The Defense of New Orleans, *Louisiana History* 18: 5-62.

Saucier, Roger T.

- 1963 Recent Geomorphic History of the Pontchartrain Basin. *Louisiana State University Press, Coastal Studies Series No. 9.* Baton Rouge.
- 1983 Geomorphological and sedimentological factors involved in the investigations at English Turn, Mississippi River, Louisiana. In *Archaeological Testing at Fort St. Leon, Plaquemines Parish, Louisiana* (K. Gilmore and V. Noble, Eds.), pp 115-126. Institute of Applied Sciences, North Texas State University, Contribution to Archaeology o.2 Denton, TX.

Shenkel, Richard

- 1984 Early Woodland in Coastal Louisiana. In *Perspectives on Gulf Coast Prehistory.* D.D. Davis (ed.). University of Florida Press, Gainesville.

Sherrod, P. Clay and Martha Ann Rolingson

- 1987 *Surveyors of the Ancient Mississippi Valley.* Arkansas Archaeological Survey Series No. 28. Fayetteville.

Smith, Steven D., Philip G. Rivet, Kathleen M. Byrd and Nancy W. Hawkins

- 1983 *Louisiana's Comprehensive Archaeological Plan.* State of Louisiana, Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge.

Southern Manufacturer

- 1905 *Sketchbook, The Lower Coast, its Resources, Institutions and Splendid Progress.* New Orleans: Southern Manufacturer.

Stout, Michael E.

- 1988 *Assessment of Project Impacts on the Archaeological Resource Base of the Terrebone Marsh, Atchafalaya Basin, Louisiana: A Phased Approach.* Paper presented at the Southeastern Archaeological Conference, October 19-22, 1989, New Orleans.

Torrey, V. H., III

- 1988 *Retrogressive Failures in Sand Deposits of the Mississippi River, Report No. 2: Emprical Evidence in Support of the Hypothesized Failure Mechanism and Development of the Levee Safety Flow Slide Monitoring System. U.S. Army Waterways Experiment Station, Technical Report GL-88-9, Vicksburg, MS.*

U.S. Army Corps of Engineers

- 1981 *Water Resources Development in Louisiana (1981) by the U.S. Army Corps of Engineers.* Prepared by the New Orleans District Office.
- 1988 *Mississippi River - Gulf Outlet, St. Bernard Parish, Louisiana Reconnaissance Report on Channel Bank Erosion.* Prepared by the New Orleans District Office.

United States Department of Agriculture (USDA)

- 1971 *Parish General Soil Maps, Alexandria, La. in press Soil Survey of St. Bernard Parish, Louisiana.* Ft. Worth: USDA

Voorhies, Jacqueline K. (Ed.)

- 1973 *Some Late 18th Century Louisianians: Census Records of the Colony, 1758-1796,* Lafayette: University of Southwestern Louisiana Press.

Wall, Bennett H. (Ed.)

- 1984 *Louisiana: A History.* Arlington Heights, IL: Forum Press.

Watson, C.C.

- 1982 *An Assessment of the Lower Mississippi River Below Natchez, Mississippi.* Unpublished Ph.D. Dissertation, Colorado State University, Ft. Collins, CO.

Webb, Clarence H.

- 1982 *The Poverty Point Culture (Second, Revised Edition)*. Geoscience and Man Vol. 17. School of Geoscience, Louisiana State University, Baton Rouge.

Weinstein, Richard A. and Philip G. Rivet

- 1978 *Beau Mire, a Late Tchula Period Site of the Tchefuncte Culture*. Department of Culture, Recreation and Tourism, Louisiana Archaeological Survey and Antiquities Commission, Baton Rouge.

White, David A., S.P. Darwin, and L.B. Thein

- 1983 Plants and Plant Communities of Jean Lafitte National Historical Park, Louisiana. *Tulane Studies in Zoology and Botany*. 24: 101-129.

Wicker, K. M.

- 1980 *The Mississippi River Delta Plain Region Habitat Mapping Study*. U.S. Fish and Wildlife Service, Office of Biological Services, FWS/OBS-79-07.

Wicker, K.M., G.C. Castille III, D.J. Davis, S.M. Gagliano, D.W. Roberts, D.S. Sabins and R.A. Weinstein

- 1982 *St. Bernard Parish: A Study in Wetland Management*. Prepared for the St. Bernard Parish Police Jury by Coastal Environments, Inc., Baton Rouge.

Wiseman, Diane E., Richard A. Weinstein and Kathleen G. McCloskey

- 1979 *Cultural Resources Survey of the Mississippi River Gulf Coast Outlet, Orleans and St. Bernard Parishes, Louisiana*. Prepared for the U.S. Army Corps of Engineers, New Orleans District, by Coastal Environment, Inc, Baton Rouge.

Wiseman, Diane E., R.A. Weinstein, and K.G. McCloskey

- 1981 *Cultural Resources Survey of the Mississippi River Gulf Outlet, Orleans and St. Bernard Parishes, LA*. Report submitted to the U.S. Army Corps, New Orleans District.

Yakubik, Jill-Karen and Herschel A. Franks

1988 Archaeological Investigations of Four Spanish Colonial Period Sites, Jefferson Parish, Louisiana. Paper presented at the 50th meeting of the Southeastern Archaeological Conference, New Orleans.

Other Sources Cited

American State Papers, Vol. 3.

Book of Sheriff's Deeds. St. Bernard Parish

Conveyance Office Records, St. Bernard Parish.

***House Reports*, 23 Congress, 1st Session, Document 73.**

New Orleans Notarial Archives (NONA).

Oliver Succession. Chain of Title in the Succession of Elina Oliver, Widow of Joseph Marcel Ducros, No. 454, 22nd Judicial District A, St. Bernard Parish. 1785. Located in the Louisiana Collection, Howard Tilton Memorial Library, Tulane University.

Toutant Beauregard Family Genealogy, Louisiana Collection, Howard-Tilton Library, Tulane University.

**Report of the Special Committee on the Mexican Gulf Railroad, 1866.
Louisiana Collection, Howard Tilton Memorial Library, Tulane University.**